### COLLEGE OF AGRICULTURE

#### DEPARTMENTAL CURRICULUM

Curriculum for B. Agric. Degree Programmes

#### 100 LEVEL HARMATTAN SEMESTER

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**TOTAL** | **22**

#### 100 LEVEL RAIN SEMESTER

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**200 LEVEL HARMATTAN SEMESTER**

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<td>AGY 205</td>
<td>Crop Anatomy, Taxonomy &amp; Physiology</td>
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<td>WEM 201</td>
<td>Principles of Forestry &amp; Wildlife</td>
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<td>Anatomy &amp; Physiology of Farm Animals</td>
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<td>AEE 201</td>
<td>Principles of Agricultural Economics</td>
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<td>Basic Aromatic &amp; Natural Product Chemistry</td>
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409
### 300 LEVEL HARMATTAN SEMESTER

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<td>Crop Genetics &amp; Breeding</td>
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<td>AGY 305</td>
<td>Pests &amp; Microorganisms in Agriculture</td>
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<td>AGY 307</td>
<td>Pedology &amp; Soil Physics</td>
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<td>Introduction to Farm Machinery</td>
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<td>Principles of Production Economics</td>
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<td>Extension Teaching, Programme Planning &amp; Organisation</td>
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<td>Statistics &amp; Data Processing</td>
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<td>Non-Ruminant Animal Production</td>
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<td>Agricultural Biochemistry &amp; Methods</td>
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<td>Introduction to Logic and Philosophy</td>
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<td>Techniques in Soil &amp; Water Management</td>
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(c) Bachelor of Agriculture (B. Agric.) with options in Agricultural Extension & Rural Development

HARMATTAN SEMESTER

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<td>Agrarian &amp; Business Law</td>
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<td>Foundation of Social Action &amp; Group Dynamics</td>
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<td>Theory of Social &amp; Technological Change (with application in rural communities)</td>
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<td>Evaluation of Extension &amp; Rural Development Programmes/Projects</td>
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<td>AEE 540</td>
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**TOTAL** 18
COURSE DESCRIPTION

100 LEVEL

BIO 101 Basic Biology I 4 units


Teaching Units:

1. A generalized survey of plant and animal kingdom.
3. Functions of cellular organelles.
4. Mitosis, Meiosis and Heredity.
5. Characteristics and classification of living things.
7. Diversity, morphology and general characteristics of algae, bryophytes, pteridophytes, gymnosperms and angiosperms.
8. Basic principles of Zoological Nomenclature.
10. Diagnostic features of major animal phyla and their classes.

BIO 102 Basic Biology II 4 units


Teaching Units:

1. Similarities and differences in external features of plant and animal Kingdoms.
4. Endocrine system, Respiration,
5. Reproduction,
10. Energy flow and Nutrient cycling.
11. Dynamics of population and communities.
12. Man and environment.

MTH 101 Elementary Mathematics II (Algebra and Trigonometry)
(3 units) (L30: P 0:T0)

Teaching Units:
1. Elementary set theory, subsets, union, intersection, complements and Venn diagrams.
2. Real numbers: real sequences and series,
5. Matrices,
6. Complex numbers: Algebra of complex numbers - the Argand Diagram, De Moivre’s theorems, $n^{th}$ roots of unity.
7. Circular measure, Trigonometric functions of angles any magnitude, addition and factor formulae.

MTH 102 Elementary Mathematics II (Introduction to Calculus) (3units) (L30: P 0:T15)
Functions of a real variable, graphs, limits and idea of continuity. The derivate as limit of rate change. Techniques of differentiation. Extrema and curve sketching: Integration as an inverse of differentiation, Methods of intergration. Definite integrals. Application to areas and volumes.

Pre-requisite: MTH 101, Co-requisite: MTH 104

Teaching Units:
1. Functions of a real variable, graphs, limits and idea of continuity.
2. The derivate as limit of rate change.
3. Techniques of differentiation.
4. Extrema and curve sketching:
5. Integration as an inverse of differentiation, Methods of integration. Definite integrals. Application to areas and volumes.

CIT 101 Introduction to Information and Communications

Technology (2units)
Definition of computer and computer related concepts; comprehensive history of modern computer technology, Evolution of micro computer system; Concept of computer hardware, software and firmware; Identification of different parts of the computer and learn to get friendly with the machine (Finger positioning on the keyboard); The dos and don'ts in a computer laboratory and media units handling; Social impact of computers (positive and negative impacts); familiarization with application packages (Microsoft Windows, Microsoft word, Excel etc), Program Development; Flowcharts and algorithms; Program Objects using BASIC or VISUAL BASIC fundamentals.

30h (L);45h (P)

Teaching Units:
1. Definition of computer and computer related concepts;
2. Comprehensive history of modern computer technology, Evolution of micro computer system;
3. Concept of computer hardware, software and firmware; Identification of different parts of the computer and learn to get friendly with the machine (Finger positioning on the keyboard);
4. The dos and don’ts in a computer laboratory and media units handling;
5. Social impact of computers (positive and negative impacts);
6. Familiarization with application packages (Microsoft Windows, Microsoft word, Excel etc),
7. Program Development; Flowcharts and algorithms;
8. Program Objects using BASIC or VISUAL BASIC fundamentals.

**CIT 102 Introduction to Computer Programming 1 (2Units)**

Introduction to problem solving strategies/methods and algorithm implementations strategies, concepts and properties, Algorithm development, designing, coding, debugging and documenting programmes using techniques of a good programming language style, programming language. A widely used programming language should be used in teaching the above. e.g. FORTRAN 95

30h (L); 45h (P)

Teaching Units:

1. Introduction to problem solving strategies/methods
2. Algorithm implementations strategies,
3. Concepts and properties,
4. Algorithm development, designing, coding,
5. Debugging and documenting programmes using techniques of a good programming language style, programming language. A widely used programming language should be used in teaching the above. e.g FORTRAN 95

**PHY 101: General Physics 1 (3units)**

Space and time, units and dimensions, Kinematics. Fundamental laws of Mechanics, statics and dynamics; Work and energy; Conservation laws.

Elasticity; Hooks’s law, Young’s shear and bulk moduli; Hydrostatics; Pressure; buoyancy, Archimedes’ Principles; Surface tension; adhesion, cohesion, capillarity, drops and bubbles. Temperature: Heat, gas laws. Laws of thermodynamics; Kinetic theory of gases. Sound. Applications.

Co-requisite MTH 101

Teaching Units:

1. Space and time, units and dimensions, Kinematics.
2. Fundamental laws of Mechanics, statics and dynamics;
3. Work and energy; Conservation laws.
4. Elasticity; Hooks’s law, Young’s shear and bulk moduli;
5. Hydrostatics; Pressure; buoyancy, Archimedes’ Principles; Surface tension; adhesion, cohesion, capillarity, drops and bubbles.
7. Laws of thermodynamics; Kinetic theory of gases.
8. Sound.

**PHY 102 General Physics II (3units)**


*Co-requisites: MTH 102*

**Teaching Units:**

2. Geometrical optics.
3. Electrostatics - Electric charges and fields.
4. Gauss’s Law.
5. Electric Potential, conductors and dielectrics in electrostatics.
7. The forces exerted by a magnetic field. Magnetic fields produced by steady current.
9. Electromagnetic oscillations and waves; Applications,
10. Elementary modern Physics- Bohr’s Theory,
11. Photo electric effect, De Broglie equation and elementary semiconductor Physics.

**PHY 191/192: Experimental Physics IA/IB (1unit)**

Introductory experiments in general measurements, errors and graphical analysis. The experiment includes simple experiments in mechanics and properties of matter, heat and thermodynamics. Electrical and mechanical resonant system, etc covered in PHY 107 and PHY 108.

**Teaching Units:**

1. Introductory experiments in general measurements, errors and graphical analysis.
2. Simple experiments in mechanics and properties of matter, heat and thermodynamics.
3. Experiments in Electrical and mechanical resonant system, etc

**CHM 101 General Chemistry I 2+1+0 (3credits)**
Physical Qualities and Units

The physical qualities understood as consisting of numerical magnitude and units. International system of units: base units, mass length time, current, amount of substance. Other units expressed as products or quotients of base units.

Relative Masses of Atoms And Molecules


Atomic and Nuclear Basis


Chemical Bonding

Dependency of properties of solids, liquids and gases on type of chemical bonding. Electrovalent bond between ions. Covalent bond. The shape of simple molecules including CO₂ (linear), CH₄ (tetrahedral), NH₃ (pyramids), HO (nonlinear), SO (trigonal), SF (octahedral), metallic bonds. Intermolecular bonds. Hydrogen Bonding and its influence on properties.

Teaching Units:

1. Physical Qualities and Units: The physical qualities understood as consisting of numerical magnitude and units.
2. International system of units: base units, mass length time, current, amount of substance. Other units expressed as products or quotients of base units.
4. The mole concepts and the Avogadro’s constant. Determination of relative masses.
7. The nucleus, atomic number, mass isotope and mass spectra.
8. The electronic structure of atom.
9. Radioactivity; x-ray radiation and detection.
11. Radiation as energy, the Plank’s relation, regions of electromagnetic absorptions and emission of radiation. Wave particle dualism and De-Broglie equation treated symbolically.
13. The size, shape and orientation of atomic orbitals. Radical and Polar diagrams and the effects of nuclear charge.
15. Chemical Bonding: Dependency of properties of solids, liquids and gases on type of chemical bonding.
17. The shape of simple molecules including CO₂ (linear), CH₄ (tetrahedral), NH₃ (pyramids), HO (nonlinear), SO₂ (trigonal), SF₆ (octahedral), metallic bonds.

**CHM 102 General Chemistry II 2+1+0 (3credits)**

**Gases, Liquids and solids**

Derivation of ideal gas leading to Boyle’s Law and Avogadro’s hypothesis. The Avogadro constant. A simplified treatment (e.g particle in a box). The assumption for ideal behavior and their limitation for real gases at high pressure and low temperature. Boltzmann distribution and molecule speed. Boltzmann constant.

Liquids: the kinetic concept of liquid state and simple kinetic-molecular description of melting, vapourization and vapour pressure saturated and unsaturated vapors.

Phase equilibra: Phase rule, equilibria involving one, two and three components.

Solids: Lattice structure and spacing. NaCl as ionic lattice. Cu as a cubic close-packed metal lattice. Graphite and Diamond- their properties as macromolecular structures. Lattice energy and forces between the particles in atomic molecular and ionic lattice.

**Electrolysis:**

The factors affecting mass of substance liberated during electrolysis. Relationship between Faraday and the Avogadro’s constant and the charge of the electron.

**Equilibra:**


**Chemical Kinetics**

Simple rate equations; order of reactions; rate constants. Rate = K (A) reactions, simple calculations on half life. Quantitative effects temperature on rate constants. Catalysis.

**Thermo-chemistry and Chemical Energetics:**

Standard enthalpy changes of reaction, formation, combustion and neutralization: Hess Law, Lattice energy for simple ionic crystals. A treatment of the Born-Haber cycle is not required.
Teaching Units:

1. Gases, Liquids and solids: Derivation of ideal gas leading to Boyle’s Law and Avogadro’s hypothesis. The Avogadro constant. A simplified treatment (e.g. particle in a box).
2. The assumption for ideal behavior and their limitation for real gases at high pressure and low temperature.
4. Liquids: the kinetic concept of liquid state and simple kinetic-molecular description of melting, vaporization and vapour pressure saturated and unsaturated vapors.
5. Phase equilibria: Phase rule, equilibria involving one, two and three components.
7. Graphite and Diamond— their properties as macromolecular structures. Lattice energy and forces between the particles in atomic molecular and ionic lattice.
9. Relationship between Faraday and the Avogadro’s constant and the charge of the electron.
11. Equilibrium constraints: their definition and calculation in terms of concentrations. Effect of temperature of equilibrium constants.
13. The ionic product of water Kw .pH and calculation, pH indicators, Choice indicators, Buffer solutions.
15. Rate = K (A) reactions, simple calculations on half life. Quantitative effects temperature on rate constants. Catalysis.

C. COURSES OFFERED BY THE DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION (AEE):

AEE 101: Mathematics in Agriculture I (C), L15, T15, Units 2.


Teaching Units:

1. Real number system, Sets, Venn diagram and set operations.
2. One-way correspondence between sets.
3. Elementary functions and their graphs.
4. Equations and their solutions.
5. Solutions of systems of linear equations.
7. Types of vectors and their applications, vector operations.

**AEE 102: Statistics in Agriculture (C) L15 T15, Units 2**

Definition and diagrammatic representation of descriptive data, frequency distribution, frequency polygon, histogram, scatter diagram, measures of location and dispersion for grouped and ungrouped data, permutations and combinations; theory of probability; binomial theorem and distribution. Collection, tabulation and representation of agricultural data; correlation, simple analysis of variance and linear regression.

**Teaching Units:**

1. Definition and diagrammatic representation of descriptive data, frequency distribution, frequency polygon, histogram, scatter diagram.
2. Measures of location and dispersion for grouped and ungrouped data.
3. Permutations and combinations; theory of probability; binomial theorem and distribution.
4. Collection, tabulation and representation of agricultural data;
5. Correlation, simple analysis of variance and linear regression.

**AEE 103: Mathematics in Agriculture II. (C) L15 T15, Unit2.**


**Teaching Units:**

1. Functions, limits and continuity. Trigonometric functions.
2. Difference Quotient and the derivative. Applications of differentiation.
3. Differentiation of elementary transcendental functions.
4. Indefinite and definite integrals.
5. Geometric and physical applications of the definite integral.
6. Curves and their properties, curve tracing.
7. Sequences and series.
8. Partial differentiation and its application.

**AEE 104: Principles of Accounting (C) L30 T15, Units 3**


**Teaching Units:**
3. Double entry principles, Ledgers and Trial Balance.
4. Correction of errors and suspense account;
5. Capital and Revenue; Income and Expenditure. Bank reconciliation statement;
6. Accounting concepts and conventions.
7. Final accounts of a sole trader and Adjustment to final account;
8. Provisions and Reserves; Manufacturing accounts.
9. Acquisition, Depreciation and Disposal of Fixed Assets.
10. Single entry book-keeping, incomplete records, self balancing ledgers and control accounts.
11. Analysis and interpretation of accounts.

AEE 105: Introduction to Agribusiness (C) L30 T15 Units 3


Teaching Units:

1. Meaning and scope of Agribusiness.
2. Evolution and economic importance of agribusiness.
3. Special features and study approaches to agribusiness.

AEE 106: Introduction to Business Law (C) L15 T15, Units 2

Courts and court procedures in Nigeria, contracts; sales; bailments; commercial papers (promissory notes, drafts, cheques, etc). Agency and employment; partnerships; corporations; property and insurance.

Teaching Units:

1. Courts and court procedures in Nigeria,
2. Contracts; sales; bailments;
3. Commercial papers (promissory notes, drafts, cheques, etc).
4. Agency and employment; partnerships; corporations; property and insurance.

AEE 107: Introduction to Cooperation (C) L30 T15 Units 3

The concept of Small Holder ORGANIZATIONs (SHOs) and Non- Governmental ORGANIZATIONs (NGOs). The distinction between indigenous cooperative and modern cooperatives. Distinguishing cooperatives from other business ORGANIZATIONs, clarification of cooperatives. The financing and management of cooperatives. Cooperatives in socio-economic development. The early history of cooperative in Nigeria. A survey of the structure of the cooperative movement in Nigeria. An overview of the problems of co-operatives in Nigeria.
Teaching Units:

1. The concept of Small Holder ORGANIZATION (SHOs) and Non-Governmental ORGANIZATIONs (NGOs).
2. The distinction between indigenous cooperative and modern cooperatives.
3. Distinguishing cooperatives from other business ORGANIZATIONs, clarification of cooperatives.
5. The early history of cooperative in Nigeria.
7. An overview of the problems of co-operatives in Nigeria.

AEE 108: Principles of Cooperative (C) L 30 T15, Units 3.

The industrial revolution in Britain, its effects and consequences. Early cooperative leaders and founders. The pre-Rochdale co-operatives and their failure. The Rochdale pioneers and the Rochdale society of equitable pioneers. The business practices of the Rochdale pioneers and the principles. First International Cooperative Association (ICA) review of the Rochdale principles (1966). Raifficisen Schultze Delitzsch, the application of the principles to the different types of co-operatives and in different socio-economic and political circumstances.

Teaching Units:

1. The industrial revolution in Britain, its effects and consequences.
2. Early cooperative leaders and founders.
3. The pre-Rochdale co-operatives and their failure.
4. The Rochdale pioneers and the Rochdale society of equitable pioneers.
5. The business practices of the Rochdale pioneers and the principles.
7. Raifficisen Schultze Delitzsch, the application of the principles to the different types of co-operatives and in different socio-economic and political circumstances.

AEE 110: Principles of Management (C) L15 T15, Units 2

Basic concepts in management; Management principles; functions of the manager; planning, nature and purpose; span of management, Departmentalisation, Line and staffing authority, service department; staffing and directing; selection of managers; Appraisal of managers;

Management development and nature of directing.

Teaching Units:

1. Basic concepts in management;
2. Management principles; functions of the manager; planning, nature and purpose; span of management,
3. Departmentalization, Line and staffing authority, service department; staffing and directing;
4. Selection of managers; Appraisal of managers;
5. Management development and nature of directing.
AEE 201: Introduction to Microeconomics (C) L15,T15,Units 2.


Teaching Units:

1. Introduction to agricultural economics, scope and methods.
3. Price theory, determinants of supply and demand, and application to agricultural problems.
4. Production cost functions, types of market, theories of distribution and resource allocation on farms.

AEE 202: Introduction to Macroeconomics (c) L15,T15,Units 2

National income and its determinants. Money and banking, international trade, economic development, planning and economic fluctuations. The role of public policy as it affects all the above in Nigeria. Inflation and the rural sector.

Teaching Units:

1. National income and its determinants.
2. Money and banking,
3. International trade,
4. Economic development, planning and economic fluctuations.
5. The role of public policy as it affects all the above in Nigeria.
6. Inflation and the rural sector.

AEE 203: Introduction to Agricultural Extension and Rural Sociology (c) L15, T15 Units 2.

Historical background to extension from the beginning, Definition of agricultural extension, its place in the scheme of agriculture. The various extension systems. Rural development and its approaches. How adults learn. The teaching-learning system. The content of innovations or agricultural technologies. The concept of innovation adoption, steps in the adoption process and categories of adopters. Factors affecting adoption and the adoption rate in agriculture. The extension methods: the individual, group and mass media contact methods. Extension communication, elements of extension communication. Definition of rural sociology and the origin of rural sociology, its link with agricultural extension. Difference between the rural and urban sectors. Rural social institutions, culture and social processes in rural areas. Social ORGANIZATIONS. Concepts of cooperation, competition, acculturation, accommodation and assimilation.

Teaching Units:

1. Historical background to extension from the beginning,
2. Definition of agricultural extension, its place in the scheme of agriculture.
3. The various extension systems. Rural development and its approaches.
4. How adults learn. The teaching-learning system.
5. The content of innovations or agricultural technologies.
6. The concept of innovation adoption, steps in the adoption process and categories of adopters.
7. Factors affecting adoption and the adoption rate in agriculture.
8. The extension methods: the individual, group and mass media contact methods. Extension communication, elements of extension communication.
9. Definition of rural sociology and the origin of rural sociology, its link with agricultural extension.
10. Difference between the rural and urban sectors.
11. Rural social institutions, culture and social processes in rural areas.
12. Social organizations.
13. Concepts of cooperation, competition, acculturation, accommodation and assimilation.

AEE 204: Introduction to Home Science, Hospitality and Tourism (c) L15 T15 Units 2

Philosophy, scope, objectives and historical development of Home science, hospitality and tourism. How these industries help to meet basic and major human needs with respect to food, clothing, shelter, health, recreation, education, travel and visits, exploration and discoveries.

Teaching Units:
1. Philosophy, scope, objectives and historical development of Home science, hospitality and tourism.
2. How these industries help to meet basic and major human needs with respect to food, clothing, shelter, health, recreation, education, travel and visits, exploration and discoveries.

AEE 211: Introduction to Cost and Management Accounting in Agribusiness (c) L30, T15, Units 3.


Teaching Units:
2. Theory of cost behaviour.
3. Materials costing and labour costing.
4. Overhead, process costing and job/ batch costing.

AEE 212: Theory and Practice of Management in Cooperative and Agribusiness. (C) L15, T15, Units 2

Teaching Units:

1. Motivation, leadership and controlling. The control process, control techniques.
3. Managerial behaviour in Nigeria.
5. Transferability of management system.
6. Management practice or management conduct.
7. Criteria for locating bad management practices.

AEE 213: Principles of Marketing in Cooperative and Agribusiness. (c) L15, T15, Units 2


Teaching Units:

1. Definitions of Marketing.
2. Relationship between nature of products and marketing strategies.
3. Price analysis policy for development.
4. Marketing functions, costs and margin.
5. Marketing channels for commodities.
6. Problems of marketing in Nigeria.
7. The role of government in product marketing.
8. Case studies.

AEE 214: Business ORGANIZATIONs (c) L15, T15 Units 2

Meaning and scope of business ORGANIZATIONs. Types of business ORGANIZATIONs e.g solo proprietorship, partnership, joint stock companies and limited liability companies, Public enterprises e.g statutory corporations and public utilities. Cooperative societies. Financing business ORGANIZATIONs. Management and problems of business organizations.

Teaching Units:

1. Meaning and scope of business organizations.
2. Types of business organizations e.g. sole proprietorship, partnership, joint stock companies and limited liability companies,
3. Public enterprises e.g statutory corporations and public utilities.
4. Cooperative societies.
5. Financing business organizations.

AEE 215: Cooperative Legislation (c) L30 T15, Units 3

The functions and nature of cooperative legislation. The history of cooperative legislation in Nigeria. The Registrar of cooperative societies and his function. Provision of model bye-laws; control of investments; auditing, inspection, examination, inquiry, liquidation,
arbitrations, etc. funds and properties of societies and liabilities. Cooperative society rules. The link between cooperative principle and cooperative law.

Teaching Units:

1. The functions and nature of cooperative legislation.
2. The history of cooperative legislation in Nigeria.
3. The Registrar of cooperative societies and his function.
4. Provision of model bye-laws; control of investments; auditing, inspection, examination, inquiry, liquidation, arbitrations, etc.
5. Funds and properties of societies and liabilities.
7. The link between cooperative principle and cooperative law.

AEE 216: Economics of Cooperatives (C) L15, T15, Units 2


Teaching Units:

1. The financing of the cooperative enterprise share capital.
2. Productive cooperatives, advantages and problems.
3. Integration in the cooperatives.
4. Pricing in the cooperatives.
5. Case studies.

AEE 217: Cooperative and Rural Development Law I (E) L30 T15 Units 3


AEE 218: Economics of Cooperative (C) L15, T15, Units 2.

Partnership accounts. P&L Appropriation and Balance sheet; capital and current account of partner; Admission and retirement of a partner; Dissolution of partnership; Conversion of partnership to a Limited Company. Company accounts; P and L Appropriation and Balance sheet; Issue, forfeiture and redemption; sinking fund account; contract accounting; Consignment; Department account; Branch account; Underwriters; Royalties; Hire purchase; Pension and provident fund accounts; Bankruptcy accounts; and Bill of exchange.

Teaching Units:

1. Partnership accounts. P&L Appropriation and Balance sheet; capital and current account of partner;
2. Admission and retirement of a partner; Dissolution of partnership;
4. Company accounts; P and L Appropriation and Balance sheet; Issue, forfeiture and redemption; sinking fund account; contract accounting;
5. Consignment; Department account; Branch account; Underwriters; Royalties; Hire purchase; Pension and provident fund accounts;
6. Bankruptcy accounts; and Bill of exchange.

**AEE220: Cooperative and Rural Development Law II (E) L30 T15 units 3**

Legal issues affecting rural development. Distinction between Community Development (CD), Rural Development (RD), Agricultural Development (AD), and Cooperative Development (CoopDEV). The future of Nigerian rural and urban communities. Review and analysis of the various rural development and cooperative laws in Nigeria. Review and analysis of rural and cooperative development projects in Nigeria.

**AEE 301: Principles of Production Economics (c) L30,T15,Units 3**

Economic principles underlying market exchange processes with particular reference to the theory of price mechanism in a market economy. Utility theory and the concept of indifference curves. The deviation of Engel’s curves and household demand curves. The income and substitution effects of price change on normal and inferior goods. The nature of the demand for agricultural products. The principles of revealed preference and concept of index numbers as indicators of individual welfare changes. The deviation of farm-firm production functions. The nature of the demand and supply curves for agricultural inputs. Market equilibrium analysis under various market structures, specifically under perfect competition, monopoly, monopolistic competition, duopoly and oligopoly. The marginal productivity theory of distribution in perfectly competitive markets. Theories and principles of agricultural enterprises location, including comparative advantage and Von Thuner principles. Introduction to the theory of general equilibrium. The theory of welfare economics.

**Teaching Units:**

1. Economic principles underlying market exchange processes with particular reference to the theory of price mechanism in a market economy.
2. Utility theory and the concept of indifference curves. The deviation of Engel’s curves and household demand curves.
3. The income and substitution effects of price change on normal and inferior goods.
4. The nature of the demand for agricultural products.
5. The principles of revealed preference and concept of index numbers as indicators of individual welfare changes.
6. The deviation of farm-firm production functions.
7. The nature of the demand and supply curves for agricultural inputs.
8. Market equilibrium analysis under various market structures, specifically under perfect competition, monopoly, monopolistic competition, duopoly and oligopoly.
9. The marginal productivity theory of distribution in perfectly competitive markets.
10. Theories and principles of agricultural enterprises location, including comparative advantage and Von Thuner principles.
11. Introduction to the theory of general equilibrium.
12. The theory of welfare economics.

**AEE 302: Statistics and Data Processing (c) L15,T15Units 2**


Teaching Units:

1. Basic concepts of statistics. Frequency distribution, measures of location, measures of dispersion.
3. Sampling data collection, data processing techniques, statistical inference, tests of hypothesis: F-test, T-test, Chi-square.
5. Formulation of research objectives, field experimentation, collection and processing of data.

**AEE303: Relevance of Cooperative to Agribusiness. (c) L15,Units 1.**

Meaning and scope of Cooperative and agribusiness. Evolution and economic importance of Cooperatives and agribusiness. Special features and study approaches to agribusiness and cooperatives. Case studies. Advanced empirical issues in cooperative and agribusiness Interrelationship between cooperative and agribusiness.

Teaching Units:

1. Meaning and scope of Cooperative and agribusiness.
2. Evolution and economic importance of Cooperatives and agribusiness.
3. Special features and study approaches to agribusiness and cooperatives.
4. Case studies.
5. Advanced empirical issues in cooperative and agribusiness.
6. Interrelationship between cooperative and agribusiness.

**AEE 304: Fundamentals of Farm Management (C) L15,T15Units 2**

Meaning, scope and objectives of agricultural management. Functions and tools of farm management. Effects of socio-economic environment on farm management functions. Steps in farm management decisions. ORGANIZATION of farm- farm, farm selection, farm layout, enterprise selection and the distribution of investment. The need for farm management information and the positive and normative approaches to farm management information collection. Farm records and accounting. Principles of farm asset valuation and depreciation. Farm budgeting, including complete, partial and breakeven budgeting. Linear programming as a tool for farm enterprise planning. Analysis of farm business performance-measures of efficiency, financial position and farm business size.
Teaching Units:

1. Meaning, scope and objectives of agricultural management.
2. Functions and tools of farm management.
3. Effects of socio-economic environment on farm management functions.
4. Steps in farm management decisions.
5. Organization of farm-firm, farm selection, farm layout, enterprise selection and the distribution of investment.
6. The need for farm management information and the positive and normative approaches to farm management information collection.
7. Farm records and accounting.
9. Farm budgeting, including complete, partial and breakeven budgeting.
10. Linear programming as a tool for farm enterprise planning.

AEE 305: Extension Teaching, Programme Planning and ORGANIZATION (c) L15,T15,Units 2.


Teaching Units:

1. Definition of teaching and learning situations.
2. Creating teaching and learning situations.
4. Teaching methods: visual, physical, dummy (models) and audio-visuals, Educational contacts with clienteles.
5. Types of leaders and implications for extension teaching and learning.
6. The use of training resources in agricultural extension learning.
7. Micro and macro-planning in extension.
8. Design and use of programme objectives in programme building.
10. Case studies planning rural/agricultural development and training improvement programmes.
11. The old versus the new extension organizations in Nigeria.
12. A critique of the Training and Visits (T&V) system of extension.

AEE306: Introduction to Agricultural Journalism (c) L15,T15,Units 2
Definition of journalism and journalism as a profession. Journalism ability and training. Journalism and the society. Functions of journalism- to educate, entertain and inform. Types of journalism investigative, development, entertainment, education etc. journalistic style. Basic concepts in communication. Definition of Agricultural journalism. The role of Agricultural journalism in rural development. Socio-psychology of rural people in developing countries. Audience analysis. Content analysis.

Teaching Units:

1. Definition of journalism and journalism as a profession.
2. Journalism ability and training. Journalism and the society. Functions of journalism- to educate, entertain and inform.
3. Types of journalism investigative, development, entertainment, education etc. journalistic style.
4. Basic concepts in communication.
5. Definition of Agricultural journalism.
6. The role of Agricultural journalism in rural development.
7. Socio-psychology of rural people in developing countries.

**AEE 311: Principle of Auditing in Cooperatives. (c) L15,T15,Units 2.**

Introduction to auditing. Appointment, right and duties of Auditors. Auditing planning; Audit evidence; Internal control; Audit of final accounts; Audit reports and Communication with management.

Teaching Units:

1. Introduction to auditing.
2. Appointment, right and duties of Auditors.
3. Auditing planning; Audit evidence;
4. Internal control;
5. Audit of final accounts;
6. Audit reports and Communication with management.

**AEE 312: Cooperative Auditing and Investment (c) L15, T15,Units 2.**

Audit of group accounts; Investigation; special audit; Audit of computer system; Auditors Liability and case laws; International audit environment; and worldwide harmonisation.

Teaching Units

1. Audit of group accounts; Investigation; special audit;
2. Audit of computer system;
3. Auditors Liability and case laws;
4. International audit environment; and worldwide harmonisation.
AEE 313: Cost and Management Accounting in Cooperative and Business Management (c) L15, T15, Units 2.


Teaching Units:

1. Introduction to standard costing and elementary variance analysis.
2. Introduction to marginal costing.
3. Break-even analysis.
4. Joint costing, budgets and budgeting control.
5. Cost accounting ledger.
6. Uniform and integrated cost Accounting systems.

AEE 314: Cooperative Finance (c), L15, T15, Units 2

Comparisons between William Raiffisen and Schultze credit societies. The concept of thrift, savings, loans and credit. Need for short-term, medium-term and long-term credit in co-operative. Time value of money- compounding and discounting. Traditional credit institutions- “Esusu”, daily savings club, local money lender and so on. Supervised credit schemes of state government agencies. Case studies.

Teaching Units:

1. Comparisons between William Raiffisen and Schultze credit societies.
2. The concept of thrift, savings, loans and credit.
3. Need for short-term, medium-term and long-term credit in co-operative.
4. Time value of money- compounding and discounting.
5. Traditional credit institutions- “Esusu”, daily savings club, local money lender and so on.

AEE 315: Agribusiness Finance: (c) L15, T15, Units 2


Teaching Units:

1. Definition and scope of agribusiness finance.
2. Financial analysis of business organization.
3. Significance of finance to business development.
4. Source of finance to businessmen/businesswomen.
5. Records and analytical tools for financial management e.g Balance sheet, Income statement and cash flow statement.
6. Principles of taxation and taxation system.
AEE 316: Cooperative and Field Administration (c) L15,T15,Units 2.

The nature and importance of Cooperative field administration. The ORGANIZATION of the Registrar’s department. The head office and field staff. The implementation of the statutory and non-statutory functions of the Registrar. The ideal qualities of field extension officers of the Registrar of Cooperatives. Appraising the activities of the Registrar’s field officers.

Teaching Units:

1. The nature and importance of Cooperative field administration.
2. The organization of the Registrar’s department.
3. The head office and field staff.
4. The implementation of the statutory and non-statutory functions of the Registrar.
5. The ideal qualities of field extension officers of the Registrar of Cooperatives.
6. Appraising the activities of the Registrar’s field officers.

AEE 317: Government and Cooperatives (c) L15, T15, Units 2.

The rationale for government involvement in cooperatives. The form of government involvement in cooperatives. Cooperative societies law and regulations. The role of government in producer, marketing and consumer cooperatives. Establishment of Cooperatives, and cooperative policies in Nigeria.

Teaching Units:

1. The rationale for government involvement in cooperatives.
2. The form of government involvement in cooperatives.
3. Cooperative societies law and regulations.
4. The role of government in producer, marketing and consumer cooperatives.
5. Establishment of Cooperatives, and cooperative policies in Nigeria.

AEE 318: Producers and Marketing Cooperatives Management (c) L15,T15,Units 2.

Types of producer cooperatives: (i) Agricultural, livestock, fishing, fish farmers, forestry cooperatives. (ii) Industrial, processing; Artisans, Crafts and labour cooperatives. (iii) Supply and services cooperatives, and (iv) marketing cooperatives. Degree of cooperative intensity; auxiliary (service), production, promotion and strictly productive cooperatives. Types of cooperative farm, the divided land, undivided farm. Farm settlements. Industrial cooperatives in Nigeria. Cooperation in the supply of professional inputs such as credit tools, warehousing, irrigation, accounting, technical guidance, insurance, banking and transportation. Building cooperatives. Case studies in Producer cooperatives.

Teaching Units:

1. Types of producer cooperatives: (i) Agricultural, livestock, fishing, fish farmers, forestry cooperatives. (ii) Industrial, processing; Artisans, Crafts and labour cooperatives. (iii) Supply and services cooperatives, and (iv) marketing cooperatives.
2. Degree of cooperative intensity; auxiliary (service), production, promotion and strictly productive cooperatives.
3. Types of cooperative farm, the divided land, undivided farm.
4. Farm settlements.
5. Industrial cooperatives in Nigeria.
6. Cooperation in the supply of professional inputs such as credit tools, warehousing, irrigation, accounting, technical guidance, insurance, banking and transportation.
7. Building cooperatives.
8. Case studies in Producer cooperatives.

AEE 319: Human Resources Management (c) L15, T15, Units 2.

Supply and demand characteristics of labour by type. ORGANIZATION of personnel function. Manpower planning, Motivation, Leadership styles, Training and development, Performance appraisal, Disciplinary procedures; and Employee welfare.

Teaching Units:

1. Supply and demand characteristics of labour by type.
2. Organization of personnel function.
3. Manpower planning, Motivation,
4. Leadership styles,
5. Training and development,
6. Performance appraisal,
7. Disciplinary procedures; and Employee welfare.

AEE 320: Cooperative Education (c)L15, T15, Units 2.

Meaning of “Education” and “Cooperative Education”. Reasons for cooperative education. Target groups and scope of cooperative education. Aims of cooperative education as an adult education programme. Basic principles, the adult learner and the learning environment. Teaching-learning methods in cooperative education (traditional/participative methods), teaching tools and audio-visual aids- radio, TV, Video, film, etc with their uses and limitations. Financing cooperative education follow-up, evaluation and feedback mechanism or devices.

Teaching Units:

1. Meaning of “Education” and “Cooperative Education”.
2. Reasons for cooperative education.
3. Target groups and scope of cooperative education.
4. Aims of cooperative education as an adult education programme.
5. Basic principles, the adult learner and the learning environment.
6. Teaching-learning methods in cooperative education (traditional/participative methods), teaching tools and audio-visual aids- radio, TV, Video, film, etc with their uses and limitations.
7. Financing cooperative education follow-up, evaluation and feedback mechanism or devices.

Teaching Units:

1. Nature and scope of Agribusiness and management.
2. Business and environment.
3. Opportunities in agribusiness.
5. Types of management techniques.

AEE 322: Cooperative and Rural Development (c) L15, T15, Units 2

Some conception of the community. Community as an arena for social change. Dimension of community innovations for change. Theories of development case studies on rural/community development programmes and identification of factors for success and failure. The future of Nigerian rural and urban communities. Distinction between community development, rural development and cooperative development. Review and analysis of the various rural and cooperative development programmes and projects embarked upon by the various institutions and cooperative groups in Nigeria such as government ministries, universities, communities, churches, cooperative and parastatal ORGANIZATIONs- their objectives, methods, achievements, problems and implications for cooperation and rural development.

Teaching Units:

1. Some conception of the community.
2. Community as an arena for social change.
3. Dimension of community innovations for change.
4. Theories of development case studies on rural/community development programmes and identification of factors for success and failure.
5. The future of Nigerian rural and urban communities.
6. Distinction between community development, rural development and cooperative development.
7. Review and analysis of the various rural and cooperative development programmes and projects embarked upon by the various institutions and cooperative groups in Nigeria such as government ministries, universities, communities, churches, cooperative and parastatal ORGANIZATIONs- their objectives, methods, achievements, problems and implications for cooperation and rural development.

AEE 323: ORGANIZATION and Management of Cooperatives ( Consumer and Services) (c) L30, T15, Units 2.

The history of the British Consumer Cooperative Movement. The structure and problems of the consumer market in Nigeria. The concept of competitive and monopolistic market-structures. The social criticisms of the capital market- high prices, wasteful advertising, hoarding of goods, etc. The diseconomies of the prevailing distributive system. The introduction of consumer co-operation in Nigeria with the Nigeria Cooperative Society

Teaching Units:

1. The history of the British Consumer Cooperative Movement.
2. The structure and problems of the consumer market in Nigeria.
3. The concept of competitive and monopolistic market- structures.
4. The social criticisms of the capital market- high prices, wasteful advertising, hoarding of goods, etc.
5. The diseconomies of the prevailing distributive system.
6. The introduction of consumer co-operation in Nigeria with the Nigeria Cooperative Society (NSCA) in 1940.
7. Reasons for failure of early societies.
8. The choice between a “top- down” and “bottom- up” ORGANIZATION structure.
9. The history and strength of consumer cooperatives.
10. Supply problems, display, selling, stock keeping.
11. Financing, pricing, salesmanship.
13. General meeting, committee meetings and the functions of the general manager.
15. Case studies.

AEE 324: Practical Training and Industrial Attachment (c) p270 Units 6

Students will be attached to an industry agency to complete 270 hours of professional experience. The industry will be selected through cooperation between the student, the school, the SIWES coordinator and an industry supervisor.

Teaching Units:

1. Industry selection through student-school-SIWES coordinator-industry supervisor cooperation
2. Students attachment to an industry agency
3. Completion of 270 hours of professional experience.

AEE 325: Organization of Village Communities (c) L15 T15,Units 2

Major concept in leadership and community development. Village ORGANIZATION of major ethnic groups in Nigeria: settlement pattern, leadership structure, village ORGANIZATIONS. Social groups and association in rural communities: types of social groups, functions of social groups, features of social groups, characteristics of social group, and reasons why people are in these groups. Leadership in rural communities: types of leaders, theories of leadership, functions of leaders, characteristics of leaders, techniques of leadership and emergence of
leaders. Roles of leaders in rural development and extension. Development of rural community leaders. ORGANIZATIONs for rural development in Nigeria.

Teaching Units:

1. Major concept in leadership and community development.
2. Village organization of major ethnic groups in Nigeria: settlement pattern, leadership structure, village organizations.
3. Social groups and association in rural communities: types of social groups, functions of social groups, features of social groups, characteristics of social group, and reasons why people are in these groups.
4. Leadership in rural communities: types of leaders, theories of leadership, functions of leaders, characteristics of leaders, techniques of leadership and emergence of leaders.
5. Roles of leaders in rural development and extension.
6. Development of rural community leaders.
7. Organizations for rural development in Nigeria.

AEE 327: Agrarian and Land Use Law(E) L30 T15 Units 3


AEE 401: Economics of Crop and Livestock Production (c) P45 Unit 1

Practical agricultural production and resource use, resource allocation, resource and product/enterprise combination, forms of production functions and their characteristics, response analysis and measurement of resource productivity in crops and livestock production. Farm costs and revenue. Farm budgeting, gross and net margin analysis. Farm planning.

Teaching Units:

1. Practical agricultural production and resource use, resource allocation, resource and product/enterprise combination,
2. Forms of production functions and their characteristics,
3. Response analysis and measurement of resource productivity in crops and livestock production.
4. Farm costs and revenue.
5. Farm budgeting,
7. Farm planning.

AEE 402: Principles of Agricultural Marketing (c) P45 Units 1


Teaching Units:
1. Key elements in the definition of marketing.
2. The nature of agricultural products and effect on marketing.
3. Agricultural product prices.
4. Agricultural price policy for development.
5. Storage practices and problems.
6. Transportation of products and associated problems.
7. Investigation of market integration in selected commodity markets.

AEE 403: Orientation for Data Collection and Processing (c) p45, Units 1


Teaching Units:

1. Purpose and objectives of data collection, processing and utilisation.
2. Meaning, scope and purpose of farm survey.
3. Filed identification and data collection.
4. Design and sampling in farm survey.
5. Uses and limitations of primary and secondary data.
6. Interviewing techniques and problems.
7. Structure of interview of farmers and instruction manual for field data collection.
8. Pre- coding, coding and preliminary stage in data processing.

AEE 404: Farm Records and Accounting (c) P45, Units 2.

Objectives of records and accounts. Types of records. Importance of production records. Analysis of farm records. Farm inventory-valuation and depreciation. Farm financial accounts. The farm as a firm.

Teaching Units:

1. Objectives of records and accounts.
2. Types of records.
3. Importance of production records.
4. Analysis of farm records.
5. Farm inventory-valuation and depreciation.
6. Farm financial accounts.
7. The farm as a firm.

**AEE 405: Agricultural programme planning, monitoring and evaluation (c) P45, Units 1**


**Teaching Units:**

2. The concept of programme/project development in extension. The concepts, meaning and implications of the “down-up” and “up- down” extension programme plans. Examples of example programmes and extension projects.
4. Concepts of continuous evaluation and point programme evaluation.
5. Work plans and calendar of work. Graphical representation of monitoring.
6. Topics of programme evaluation: casual observation and formal methods of evaluation.
7. Design and use of structured questionnaires.
9. ADP and named rural development projects, programmes, rural health, etc.

**AEE 406: Design and use of extension training resources (C) P 45, Units 1**

Definition of an extension workshop/studio. Design of the extension studio. The workroom facilities of the equipment room facilities, the facilities, the darkroom facilities. Identification of extension training resources. The design of posters, flash card, flip charts, and use of table rouged machine. Chalkboards flannel graphs, overhead projectors, slide projectors, film projectors, dummy, real materials, camera, etc for extension training. Use of radio cassette and telecast for training practices in radio broadcasting. Guided interviews and stage drama as extension training techniques. Use of coloured markers in lettering; colour combination. Amount of words/letters on posters. Trainee centred, versus trainer- centred training technique. The use of eye- contact method in training.

**Teaching Units:**
1. Definition of an extension workshop/studio. Design of the extension studio. The workroom facilities of the equipment room facilities, the facilities, the darkroom facilities.
2. Identification of extension training resources. The design of posters, flash card, flip charts, and use of table rouged machine. Chalkboards flannel graphs, overhead projectors, slide projectors, film projectors, dummy, real materials, camera, etc for extension training.
3. Use of radio cassette and telecast for training practices in radio broadcasting.
4. Guided interviews and stage drama as extension training techniques.
5. Use of coloured markers in lettering; colour combination. Amount of words/letters on posters.
6. Trainee centred, versus trainer-centred training technique.
7. The use of eye-contact method in training.

AEE 411: Entrepreneurial Development in Cooperative and Agribusiness (C) L30, T15, Units 3

Definition and scope of entrepreneur as a factor of production. Functions of the entrepreneur. Types of entrepreneurial development strategies. The human factor in enterprises. Case studies of some small and medium scale Enterprises (SMEs)

Teaching Units:

1. Definition and scope of entrepreneur as a factor of production.
2. Functions of the entrepreneur.
3. Types of entrepreneurial development strategies.
4. The human factor in enterprises.
5. Case studies of some small and medium scale Enterprises (SMEs)

AEE 412: Cooperative and Small Enterprises Management (C) L15, T15, Units 2


Teaching Units:

3. Basic concept of management – planning, organizing, directing, coordinating and controlling and their application to cooperative and small business.
5. Steps in setting up cooperative businesses.
6. Motivation, leadership, authority and supervision in cooperative organization.
7. Functions of management committees.

AEE 413: Rural Finance and Cooperatives (c) L15, T15, Units 2

The history of CTCS and credit unions in Nigeria. The primary, secondary and tertiary cooperative credit societies. Cooperative banks, cooperative financing agencies. Government agricultural and industrial credit programs like Nigeria Agricultural Credit and Rural Development Bank (NACRDB), Bank of Industry (BDI), Nigeria Bank for Commerce and Industry (NBCI), etc. supervised credit schemes of state government agencies.

Teaching Units:

1. The history of CTCS and credit unions in Nigeria.
2. The primary, secondary and tertiary cooperative credit societies.
3. Cooperative banks, cooperative financing agencies.
4. Government agricultural and industrial credit programs like Nigeria Agricultural Credit and Rural Development Bank (NACRDB), Bank of Industry (BDI), Nigeria Bank for Commerce and Industry (NBCI), etc. supervised credit schemes of state government agencies.

AEE 414: Cooperative Project Planning, Monitoring and Evaluation (C) L15, T15, Units 2.


Teaching Units:

1. Meaning and scope of planning.
2. Identifying cooperative projects and feasibility studies.
3. Implementation planning, mobilizing resources—men, money and materials.
4. Use of committees.
5. Project implementation.
7. Marketing and revenue record.
8. Project monitoring and evaluation.
9. Rendering of reports.

AEE 415: Managerial Economics (c) L30, T15, Units 3

Teaching Units:

2. Objectives of business firms.
3. Nature of managerial problems, decision roles and tools of analysis.
4. Analysis of demand and techniques of forecasting.
5. Production and cost analysis.

AEE 416: Nigeria and International Cooperative Movement (c) L15, T15, Units 2.

The tier structure of Nigerian and international cooperative movement. The national apexes of cooperative ORGANIZATIONs in Nigeria e.g. the National Association of Cooperative Credit Unions of Nigeria (NACCUN). The structure and roles of the world cooperative ORGANIZATIONs e.g. the International Cooperative Alliance (ICA), the International Labour ORGANIZATION (ILO), and the Food and Agricultural ORGANIZATION (IFAO) of the United Nations, etc. Comparison of the cooperative movement in other countries (Indian, Israel, USA) with Nigeria suggestions for improving Nigerian cooperative movement.

Teaching Units:

1. The tier structure of Nigerian and international cooperative movement.
2. The national apexes of cooperative ORGANIZATIONs in Nigeria e.g. the National Association of Cooperative Credit Unions of Nigeria (NACCUN).
3. The structure and roles of the world cooperative ORGANIZATIONs e.g. the International Cooperative Alliance (ICA), the International Labour ORGANIZATION (ILO), and the Food and Agricultural ORGANIZATION (IFAO) of the United Nations, etc.
4. Comparison of the cooperative movement in other countries (Indian, Israel, USA) with Nigeria suggestions for improving Nigerian cooperative movement.

AEE 417: Agribusiness Development and Control (c) L30, T15, Units 3

Teaching Units:

1. Concept and strategy of business incorporation and management.
2. Concepts of policy, decision making, business objectives, performance criteria, structure and managerial behaviour.
3. Analysis of firms’ opportunities and threats.
4. Management process of corporate planning, budgeting and control.
5. Business environment.
6. Case studies in general management.

AEE 418: Seminar (c) T30, Units 2.

This course is designed to expose students to research methods, search capabilities, scientific writing techniques and seminar presentation practices. Students will be exposed to Literature searches using on line database. The student is expected to present two seminars on his/her research project at the preparatory and finishing stages as well as present at least a seminar on special topics in the field of cooperative and agribusiness management.

Teaching Units:

1. Expose students to research methods, search capabilities, scientific writing techniques and seminar presentation practices.
2. Expose students Literature searches using on line database.
3. Research methods and search capabilities.
4. Students’ seminar presentations based on his /her research project at the preparatory and finishing stages.
5. Students’ seminar on special topics in the field of cooperative and agribusiness management.

AEE 419: Research Methodology in Cooperative and Agribusiness. (c) L15,T15, Units 3

The course will examine the way that research helps to solve practical problems in cooperative and agribusiness industries. Topics will include problem identification, the logic of research, research designs, information search strategies, questionnaire development, data collection, variables and their measurement, statistical analysis methods. Written and oral communication skills, research reporting. Use of data analysis softwares.

Teaching Units:

1. Examine ways research helps to solve practical problems in cooperative and agribusiness industries.
2. Problem identification,
3. The logic of research, research designs,
4. Information search strategies,
5. Questionnaire development, data collection,
6. Variables and their measurement, statistical analysis methods.
7. Written and oral communication skills, research reporting.
8. Use of data analysis softwares.

**AEE 420: Research Project (c) P180, Units 4**

Formulation and statement of problem; development of research objectives and hypothesis, questionnaire preparation. Primary data collection. Source and collection of secondary data. Analytical methods- descriptive, statistical/quantitative, and judgmental. Presentation of research findings in narrative, tabular and graphical forms. Writing of the research project report.

Teaching Units:

1. Formulation and statement of problem; development of research objectives and hypothesis, questionnaire preparation.
2. Primary data collection.
3. Source and collection of secondary data.
5. Presentation of research findings in narrative, tabular and graphical forms.
6. Writing of the research project report.

**AEE 421: Consumer Education (c) L15, T15, Units 2**

Definition and principles of consumer education. Analysis of economic forces affecting individuals, families and institutions as consumers of goods and services. Creating awareness of the rights and responsibilities of consumers in the market place. Developing aids and techniques of making intelligent choices of foods, goods and services. Political, social, economic, and legal implications of consumer decisions and actions.

Teaching Units:

1. Definition and principles of consumer education.
2. Analysis of economic forces affecting individuals, families and institutions as consumers of goods and services.
3. Creating awareness of the rights and responsibilities of consumers in the market place.
4. Developing aids and techniques of making intelligent choices of foods, goods and services.
5. Political, social, economic, and legal implications of consumer decisions and actions.

**AEE 422: Corporate Planning (E) L15, T15, Units 2**

Teaching Units:

1. Decision making.
2. Investment decision under uncertainty.
3. Capital structure decision,
4. Dividend decision,
5. Capital market efficiency.
6. Case studies.

AEE 423: Project Preparation and Appraisal (E) L15,T15,Units 2.

Meaning and scope of project preparation. Sources of project ideas. Identification of new projects. Obstacles to project development. Meaning and scope of project appraisal. Legal description and location of the firm. Methods of valuing permanent crops, annual crops, livestock farms, machinery and farm buildings. Depreciation as a methods of valuation. Basic methods for making appraisals. Evaluation- meaning and need for evaluating projects, methods of project evaluation e.g. payback period, the pack profit method, NPV, IRR, benefit- cost ratio, etc. preparing feasibility reports.

Teaching Units:

1. Meaning and scope of project preparation.
2. Sources of project ideas.
3. Identification of new projects. Obstacles to project development.
4. Meaning and scope of project appraisal.
5. Legal description and location of the firm.
6. Methods of valuing permanent crops, annual crops, livestock farms, machinery and farm buildings.
7. Depreciation as a methods of valuation.
8. Basic methods for making appraisals.
9. Evaluation- meaning and need for evaluating projects, methods of project evaluation e.g. payback period, the pack profit method, NPV, IRR, benefit- cost ratio, etc.

AEE 424: Organizational Behaviour (c) L15,T15,Units 2


Teaching Units:
2. Group behavioural processes.
3. Leadership, task distribution and performance appraisal theories.
5. Exercise in simple models of behaviour.
7. The challenges of informal and emergent work systems.
8. The limitations of policies and the general order in controlling human behaviour.
9. Case studies in ORGANIZATIONal behaviour.

AEE 425: Marketing Promotion (E) L15, T15, Units 2

The promotion mix, elements of the promotion mix. Advertising, publicity, public relations and personal selling. Importance of the elements of the promotion mix in the entire marketing process. Case studies.

Teaching Units:

1. The promotion mix, elements of the promotion mix.
2. Advertising, publicity, public relations and personal selling.
3. Importance of the elements of the promotion mix in the entire marketing process.
4. Case studies.

AEE 426: Distribution and Sales Management (c) L1, T15, Units 2


Teaching Units:

1. Marketing channels for different categories of products.
2. Basic and advertising and sales promotion concepts.
3. The design, management and integration of a firm’s promotional strategy.
4. Sales agents, modes of transportation and their major characteristics.
5. Network analysis, techniques of transport planning.
6. Revenue concept, cost concepts and profit concept.

AEE 428: International Trade and Cooperatives (C) L15, T15, Units 2

Teaching Units:

1. Concept of International trade. The difference between international trade and local trade.
3. Merits and demerits of international cooperation.
4. The role of World Trade Organization (WTO), United Nations Conference on Trade and Development (UNCTAD).
5. Trade Liberalization and the benefits derived by developing countries.
6. International laws on cooperation and the economic implications.

AEE 501 Agricultural Production Economic (C) L3,T1,Units 3

The nature of agricultural production problems, goals and objectives of agricultural production, principles of resources use with particular reference to the optimum level of resources use. Principles of optimum product combination. Empirical production functions. Supply and cost elasticity. Production and production planning in agriculture using the methods of linear programming and simulation; production decision making under risk and uncertainty; types of production risks and uncertainties in agriculture. Production diversification and risk minimization. Uncertainty management with the use of subjective probability and the game against – nature approaches.

Teaching Units:

1. The nature of agricultural production problems, goals and objectives of agricultural production, principles of resources use with particular reference to the optimum level of resources use.
4. Production and production planning in agriculture using the methods of linear programming and simulation; production decision making under risk and uncertainty;
5. Types of production risks and uncertainties in agriculture.
6. Production diversification and risk minimization.
7. Uncertainty management with the use of subjective probability and the game against – nature approaches.

AEE 502: Principles of Agricultural and Rural Business Management (c) L30,T15,Units 3


Teaching Units:

1. Scope of agricultural and rural business management.
2. Evolution of agricultural processing industries in Nigeria.
5. Economies and diseconomies of size of operations.
6. Economics of agricultural processing.
7. Public policies affecting agricultural business financial control.
8. Case studies of agricultural and rural agro-industrial business in Nigeria.

AEE 503: Agricultural Marketing (C) L30,T15, Units 2.


Teaching Units:

1. Nature and scope of agricultural marketing, nature of agricultural products and production, and their effects on marketing.
2. Marketing functions, costs and margin.
5. Cooperative marketing of agricultural products.
6. Marketing efficiency, agricultural price policy in the context of development including objectives of positive agricultural price policy and criteria for establishment price support schemes.
8. Agricultural price analysis.
10. Methods of estimating levels of food consumption.
11. International trade in agricultural commodities.
AEE 504: Agricultural Development and Policy (C) L30,T15,Units 3

The concept of growth and development; major components of the development process; the changing roles of agriculture in the process of economic development; sources of growth in agriculture with special reference to human skill, managerial ability, savings, investment, capital accumulation and technology; the content and significance of major models of economic development, especially the models of Lewis, Okhawa, Hayami and Ruttan; case studies of Japanese, Taiwanese and Israeli agricultural development in Nigeria; analysis of government policies and programmes in relation to agricultural development in Nigeria.

Teaching Units:

1. The concept of growth and development;
2. Major components of the development process;
3. The changing roles of agriculture in the process of economic development;
4. Sources of growth in agriculture with special reference to human skill, managerial ability, savings, investment, capital accumulation and technology;
5. The content and significance of major models of economic development, especially the models of Lewis, Okhawa, Hayami and Ruttan;
6. Case studies of Japanese, Taiwanese and Israeli agricultural development
7. Analysis of government policies and programmes in relation to agricultural development in Nigeria.

AEE 505: Agricultural Cooperation (C) L30,T155,Units 3


Teaching Units:

1. Evolution of cooperative movement with particular emphasis on Nigeria.
2. Cooperative management and financing.
4. Types of cooperatives in Nigeria.
5. The Nigerian cooperative legislation.
7. Cooperative policy in Nigeria.

AEE 506: Seminar (C) T30,,Units 2

This course is designed to expose students to research methods, search capabilities. Students will be exposed to literature searches using on-line database. The student is expected to present two seminars on his/her research project at the preparatory and finishing stages as well as present at least a seminar on special topics in the area of Agricultural economics and farm management.
Teaching Units:

1. Expose students to research methods, search capabilities, scientific writing techniques and seminar presentation practices.
2. Expose students Literature searches using on line database.
3. Research methods and search capabilities.
4. Students’ seminar presentations based on his /her research project at the preparatory and finishing stages.
5. Students’ seminar on special topics in the field of Agricultural economics and farm management.

AEE 507: Statistical Methods (C) L30,T1,Units 3

Methodology and problems of farm and market surveys for data collection; sampling techniques, including simple random, stratified random, cluster and systematic sampling techniques; tabulation and presentation of statistical data with emphasis on histograms, graphs and frequency distributions; measures of central of tendency mean (arithmetic and geometric), mode, median, quartiles and decides; measures of dispersion variance, standard deviation, skewness and kurtosis; probability distributions binomial, normal, poisson, etc’ statistical inference point and interval estimation; test of hypothesis; correlation analysis simple linear, multiple and partial correlation; simple linear regression analysis; multiple linear regression analysis.

Teaching Units:

1. Methodology and problems of farm and market surveys for data collection;
2. Sampling techniques, including simple random, stratified random, cluster and systematic sampling techniques;
3. Tabulation and presentation of statistical data with emphasis on histograms, graphs and frequency distributions;
4. Measures of central of tendency mean (arithmetic and geometric), mode, median, quartiles and decides;
5. Measures of dispersion variance, standard deviation, skewness and kurtosis;
6. Probability distributions binomial, normal, poisson, etc’ statistical inference point and interval estimation;
7. Tests of hypothesis;
8. Correlation analysis simple linear, multiple and partial correlation;
9. Simple linear regression analysis; multiple linear regression analysis.

AEE 508: Research Project (C) P180Units 4

Formulation of problem statements and development of research objectives and hypothesis; analytical research methods descriptive, statistical/quantitative and judgmental; primary
Teaching Units:

1. Formulation of problem statements
2. Development of research objectives and hypothesis;
3. Analytical research methods: descriptive, statistical/quantitative and judgmental;
4. Primary data collection; sources and collection of secondary data;
5. Presentation of research findings in narrative, tabular and graphical forms;

AEE 509: Agricultural Investment Analysis and Finance (E) L30,T1, Units 3

The application of capital budgeting and budgeting control method to investment analysis. Measure of investment worth. The cost of capital. The time value of money. Capital budgeting and inflation. The concept of cost and benefit discounting. The use of cash flows for evaluating pay back period, net present value (NPV), benefit cost ration (B/C), and internal rate of return (IRR). Risk and investment portfolio selection. The analysis of potential markets for farm products. Principles of agricultural finance- the basis of interest rates, sources of loan funds and the requirement of collateral/security for loans. Special problems of using land as collateral in Nigeria. Specialised institutions for agricultural credit in Nigeria, including cooperative and thrift societies.

Teaching Units:

1. The application of capital budgeting and budgeting control method to investment analysis.
2. Measure of investment worth.
3. The cost of capital. The time value of money. Capital budgeting and inflation.
4. The concept of cost and benefit discounting. The use of cashflows for evaluating pay back period, net present value (NPV), benefit cost ration (B/C), and internal rate of return (IRR).
5. Risk and investment portfolio selection.
6. The analysis of potential markets for farm products.
7. Principles of agricultural finance- the basis of interest rates, sources of loan funds and the requirement of collateral/security for loans.
8. Special problems of using land as collateral in Nigeria.
9. Specialised institutions for agricultural credit in Nigeria, including cooperative and thrift societies.

AEE 510: Agrarian Law (E) L30,T15,Units 3


Teaching Units:
1. Land laws and policies.
2. The land use act.
3. Legal issues affecting agriculture and rural development.
4. Law of contract.
5. Law of property.

AEE 511: Natural Resources Economics (E), L30, T1, Units 3

Types and characteristics of natural resources. Natural resources use and conservation problems with emphasis on policies and institutions affecting use and conservation. Theories and principles underlying the pattern of natural resources use; ownership control and use of rights as they affect public policies and plans for natural resources conservation. Externalities and their control with reference to natural resources. Application of the theory of inquiry to natural resources problems. Analysis of alternative policies in relation to the management of natural resources and environmental quality.

Teaching Units:

1. Types and characteristics of natural resources.
2. Natural resources use and conservation problems with emphasis on policies and institutions affecting use and conservation.
3. Theories and principles underlying the pattern of natural resources use; ownership control and use of rights as they affect public policies and plans for natural resources conservation.
4. Externalities and their control with reference to natural resources.
5. Application of the theory of inquiry to natural resources problems.
6. Analysis of alternative policies in relation to the management of natural resources and environmental quality.

AEE 512: Quantitative Methods for Farm Planning (E), L30, T15, Units 3


Teaching Units:

1. A view of key mathematical and statistical concepts.
2. The principles of model building.
3. Programming models and their application to agriculture.
4. Transportation model.
5. Practical guides to inventory management and control.
6. Replacement models cost minimization and profit maximization models.
8. Work study and work simplification methods.
10. Introduction to input-output analysis.

AEE 513: International Trade (E), L30,T15,Units 3

Strategic trade theory and application. Market power and the political economy of agricultural trade. Trade principles, institutions and policies. ECOWAS as a regional trading bloc. The GATT, EU-ACP trade relationship.

Teaching Units:

1. Strategic trade theory and application.
2. Market power and the political economy of agricultural trade.
3. Trade principles, institutions and policies.
4. ECOWAS as a regional trading bloc.
5. The GATT, EU-ACP trade relationship.

AEE 514: Farm Accounting (E) L30,T15,Units 3


Teaching Units:

2. Balance sheets and profit and loss accounts.
3. Trial balance.
4. Finance and capital appraisal tools.
5. Depreciation methods and analysis.

AEE 515: Project Monitoring and Evaluation in Agriculture (E), L30,T15,Units 3

Project appraisal at the local, regional and national levels. Monitoring techniques and values. Provision of examples elucidating on the concepts of monitoring and evaluation as they apply to agriculture and rural development projects.

Teaching Units:

1. Project appraisal at the local, regional and national levels.
2. Monitoring techniques and values.
3. Provision of examples elucidating on the concepts of monitoring and evaluation as they apply to agriculture and rural development projects.

AEE 521: Adoption and Diffusion of Innovations (C), L30,T155,Units 3.


Teaching Units:

1. The innovation decision process.
2. The characteristics of innovations.
3. Adopter categories and characteristics.
4. Community characteristics and adoption.
5. The meaning and elements of diffusion.
7. Some theoretical perspectives on diffusion of innovations.
8. Generalizations from diffusion studies in Nigeria and other developing countries.
9. Diffusion curve.

AEE 522: Foundation of Social Action and Group Dynamics(C), L15,T15, Units 2

Human factor in resource development. Methods applied social change. Selected case studies on social action. Programme objectives and evaluation. Other nature and importance of group. Definitions of group and group dynamics. Group formation and group dynamics. Importance of group dynamics in extension. Blocks to participation in groups and adjustments to blocks. Group development, phases of growth, internal and external dynamic of group. Group techniques and use of group techniques. Group evaluation, importance of group evaluation, features of groups to be evaluated, and techniques of group evaluation. Highlights of some studies in group dynamics. Analysis of some groups in Nigerian extension system.

Teaching Units:

1. Human factor in resource development.
2. Methods applied social change. Selected case studies on social action.
3. Programme objectives and evaluation.
4. Other nature and importance of group.
5. Definitions of group and group dynamics.
6. Group formation and group dynamics.
7. Importance of group dynamics in extension.
8. Blocks to participation in groups and adjustments to blocks.
9. Group development, phases of growth, internal and external dynamic of group.
10. Group techniques and use of group techniques.
11. Group evaluation, importance of group evaluation, features of groups to be evaluated, and techniques of group evaluation.
12. Highlights of some studies in group dynamics.
13. Analysis of some groups in Nigerian extension system.

AEE 523: Social Statistical and Research Methods in Extension and Rural Sociology (C), L30, T15, Units 3


Teaching Units:

1. Measurement of data, sampling, descriptive statistics, bivariate and multivariate statistics including non-parametric tests, analysis of variance, correlation and regression.
2. Research report writing and research methods.
3. Methods of gathering data. Formulating and testing hypothesis.
4. Rehabilittee and validity.
5. Descriptive, inferential and non-parametric statistics; their application to data analysis.
6. Interpretation of results.

AEE 524: Theories of Social and Technological Change: Applications in Rural Communities (C), L15,T15, Units 2.

Discussions and assessments of theories of social change, technological change and rural development. Cultural evolution, diffusion, acculturation and analysis of contemporary cases relating to human problems resulting from cultural change, including directed change. Element of change, processes of understanding technological change. Technological change in Nigerian agricultural development and agricultural extension. Ethical considerations in introducing technological change. The nature of social change, planned and unplanned. Social structure and social differential. Measurement of change in rural areas. Social change in action. Social change and altitude change. Economic aspect of social and technological change. Traditional institutions and their transformation e.g. family.

Teaching Units:

1. Discussions and assessments of theories of social change, technological change and rural development.
2. Cultural evolution, diffusion, acculturation and analysis of contemporary cases relating to human problems resulting from cultural change, including directed change.
3. Element of change, processes of understanding technological change.
4. Technological change in Nigerian agricultural development and agricultural extension.
5. Ethical considerations in introducing technological change.
6. The nature of social change, planned and unplanned.
7. Social structure and social differential.
8. Measurement of change in rural areas.
10. Economic aspect of social and technological change.
11. Traditional institutions and their transformation e.g. family.

**AEE 525: Administration and Programme Planning in Extension (C), L30, T15, Units 3.**

Concepts, theories, principles and guidelines of administration, organization, and supervision as applied to extension. Administrative functions and responsibility in agricultural extension. Staff recruitment, selection, placement and supervision. Budget development and fiscal control. Importance of programme planning in agricultural extension. Detailed consideration of extension planning process, principles and concepts, such as steps in programme planning, clientele involvement, need, educational objective, learning experience. Programme implementation in extension. Extension programme documents such as plan of work, calendar of work and overall program. Case studies on project planning implementation and evaluation. The role of good public relations, good leadership and cooperation for an extension worker. Association and cooperatives concept of evaluation as applied to agricultural extension programmes.

**Teaching Units:**

1. Concepts, theories, principles and guidelines of administration, ORGANIZATION, and supervision as applied to extension.
2. Administrative functions and responsibility in agricultural extension.
3. Staff recruitment, selection, placement and supervision.
4. Budget development and fiscal control.
5. Importance of programme planning in agricultural extension.
6. Detailed consideration of extension planning process, principles and concepts, such as steps in programme planning, clientele involvement, need, educational objective, learning experience.
7. Programme implementation in extension.
8. Extension programme documents such as plan of work, calendar of work and overall program.
9. Case studies on project planning implementation and evaluation.
10. The role of good public relations, good leadership and cooperation for an extension worker.
11. Association and cooperatives concept of evaluation as applied to agricultural extension programmes.

**AEE 526: Youth and Women Programmes in Rural Communities (C), L30, T15, Units 3**

History, objectives, ORGANIZATIONS and types of youth and women programmes in Nigerian rural communities. Youth problems, women problems. Roles of government and non-
governmental agencies. Self employment opportunities for youth and women in rural communities.

Teaching Units:

1. History, objectives, organizations and types of youth and women programmes in Nigerian rural communities.
2. Youth problems, women problems.
3. Roles of government and non-governmental agencies.
4. Self employment opportunities for youth and women in rural communities.

AEE 527: Analysis of Rural Development Projects in Nigeria (C), L15 T15, Units 2

Distinction between rural development and agricultural development. Strategies for rural development. Review and analysis of the various rural and agricultural development programmes and projects embarked upon by the various institutions and groups in Nigeria. Their objectives, methods, achievements, problems and implications for agricultural extension, rural development, youth and women empowerment.

Teaching Units:

1. Distinction between rural development and agricultural development.
2. Strategies for rural development.
3. Review and analysis of the various rural and agricultural development programmes and projects embarked upon by the various institutions and groups in Nigeria.
4. Objectives, methods, achievements, problems and implications for agricultural extension, rural development, youth and women empowerment.

AEE 528: Evaluation of Extension and Rural Development Programmes/Projects (C), L15 T15, Units 2.

The nature and importance of evaluation. Definitions of evaluation, measurement, appraisal, diagnosis and tests and their significance in extension evaluation. Problem in evaluating extension programmes. Importance of evaluation in extension. The nature of the programme to be evaluated including kind, size, stage, process or product and characteristics of programme. Process and principles of evaluation, who evaluates and what depth. Developing an evaluation plan. Criteria, evidence and judgment as major concepts in evaluation. Developing evaluation instruments, type qualities such as reliability, validity and use-ability. Types and measurement of validity and reliability.

Teaching Units:

1. The nature and importance of evaluation.
2. Definitions of evaluation, measurement, appraisal, diagnosis and tests and their significance in extension evaluation.
4. Importance of evaluation in extension.
5. The nature of the programme to be evaluated including kind, size, stage, process or product and characteristics of programme.
7. Developing an evaluation plan.
8. Criteria, evidence and judgment as major concepts in evaluation.
9. Developing evaluation instruments, type qualities such as reliability, validity and use-ability.
10. Types and measurement of validity and reliability.

**AEE 529: Audio Visual Aids in Extension (C), L30,T1,Units 3**

Theoretical overview of audio-visual communication. Types of audio visual equipment such as slide projector, overhead projector, opaque projector, camera and screen. Design and production of simple audio-visual aids. Criteria for selection and use of audio-visual aids. Presentation of information through exhibits, display, slide sets, film strips, multimedia, video play back, and projected software.

**Teaching Units:**

1. Theoretical overview of audio-visual communication.
2. Types of audio visual equipment such as slide projector, overhead projector, opaque projector, camera and screen.
3. Design and production of simple audio-visual aids.
5. Presentation of information through exhibits, display, slide sets, film strips, multimedia, video play back, and projected software.

**AEE 530: Seminar (C), T30,Units 2**

This course is designed to expose students to research methods and search capabilities. Students will be exposed to literature searches using on-line database. The student is expected to present two seminars on his/her research project at the preparatory and finishing stages as well as present at least a seminar on special topics in the area of Agricultural extension and Rural Development.

**Teaching Units:**

1. Research methods and search capabilities.
2. Literature searches using on-line database.
3. Students’ seminar presentations based on his/her research project at the preparatory and finishing stages
4. Students’ seminar presentations on special topics in the area of Agricultural extension and Rural Development.

**AEE 531: Extension Organization, Management and Supervision (C), L15T15,**
Units 2


Teaching Units:

2. Roles and responsibilities of various levels of extension and other relevant staff.
3. Staff recruitment, selection, placement and supervision.
4. Principles of morale and motivation and their implications for extension staff development and promotion.
5. Creating conducive working environment.
6. Assessment of extension work accomplishments.
7. Improving Nigerian extension services.
8. Decision making in administration.
10. Role of supervisor in office management.
11. Training of extension agents, motivation and incentives.
12. Staff grievances, discipline and public relations.

AEE 532 Research Project (C), P180, Units 4

Formulation of problem statements and development of research objectives and hypotheses; analytical research methods; descriptive, statistical/quantitative and judgemental; primary data collection, sources and collection of secondary data; presentation of research findings in narrative, tabular and graphical forms. Report writing.

Teaching Units:

1. Formulation of problem statements and development of research objectives and hypotheses;
2. Analytical research methods; descriptive, statistical/quantitative and judgemental;
3. Primary data collection, sources and collection of secondary data;
4. Presentation of research findings in narrative, tabular and graphical forms.

AEE 533 Cyber Extension (C), L15 P45 Units 2
Make students to appreciate the role of internet and e-mail in development management; access development websites for appropriate information; and receive as well as send messages through e-mails and internet facilities. Concepts of development management. Introduction to micro-computers. MS-Windows XP. Internet explorer. Principles of web browsing. Accessing internet websites.

Teaching Units:
1. Make students to appreciate the role of internet and e-mail in development management;
2. Access development websites for appropriate information;
3. Receive as well as send messages through e-mails and internet facilities.
5. Introduction to micro-computers.
6. MS-Windows XP.

AEE 534 Rural Community Leadership and Development (E), L30 T15, Units 3

Teaching Units:
1. Identification, evaluation and training of leaders for community development.
2. Professional and local leaders, patron-client relationships, and value systems.
3. Some conceptions of the community.
4. Community as an arena for social change.
5. Dimensions of community innovations for change.
6. Theories of development.
7. Case studies on community development programmes and identification of factors for success and failure.
8. The future of Nigerian communities.

AEE 535 Teaching Vocational Agriculture in Schools (E), L15 T15, Units 2
Teaching Units:

1. History of vocational agriculture in Nigeria.
2. Developing a course of study and programme of work.
4. Young and adult farmers’ courses in schools.
5. Organization and supervision of agricultural unit and school farm.

AEE 536: Development Communication on Agricultural Extension (E), L30 T15, Units 3

Concept of development communication, communication and behavioural change in extension. Development communication systems. Influence of communication on rural change. The communication process including the message and its treatment. Theories and studies in communication including verbal (speech making, public speaking, discussion, persuasion and effective listening) and non-verbal communication skills. Radio and television presentation. Theory and practice of technical and journalistic writing with special preference to agriculture and rural development. Production of information materials, agricultural exhibition, advertising techniques and elementary photography. Effective mass communication including radio and television presentation. Operation/use of projected audio-visuals and public address systems.

Teaching Units:

1. Concept of development communication, communication and behavioural change in extension.
2. Development communication systems.
3. Influence of communication on rural change.
4. The communication process including the message and its treatment.
5. Theories and studies in communication including verbal (speech making, public speaking, discussion, persuasion and effective listening) and non-verbal communication skills.
7. Theory and practice of technical and journalistic writing with special preference to agriculture and rural development.
8. Production of information materials, agricultural exhibition, advertising techniques and elementary photography.
9. Effective mass communication including radio and television presentation.
10. Operation/use of projected audio-visuals and public address systems.

AEE 537 Social Psychology for Agricultural and Rural Development (E), L15 T45,

Units 2

Basic principles and importance of social psychology in extension. Empirical approach to the study of the individual in various sizes and types of social groups. Person perception, group structure and processes. Attitudes, attitude change, and influence of development communication on group behaviour, action, choice and dissonance. Socialization consensus and communication power and influence in groups. Group membership and individual behaviour.
Teaching Units:

1. Basic principles and importance of social psychology in extension.
2. Empirical approach to the study of the individual in various sizes and types of social groups.
3. Person perception, group structure and processes.
4. Attitudes, attitude change, and influence of development communication on group behaviour, action, choice and dissonance.
5. Socialization consensus and communication power and influence in groups.
6. Group membership and individual behaviour.

**AEE 538: Environmental Sociology (E), L30 T15, Units 3**

Environmental quantity and quality as social problems. Value orientations toward nature. Soil and water pollution from farms. Institutional patterns affecting the use of natural resources. Sociological aspects of resource management issues.

Teaching Units:

1. Environmental quantity and quality as social problems.
2. Value orientations toward nature.
3. Soil and water pollution from farms.
4. Institutional patterns affecting the use of natural resources.
5. Sociological aspects of resource management issues.

**AEE 539: Agrarian and Business Law (E), L15 T15, Units 2**


Teaching Units:

1. Policies and regulations governing agricultural production.
2. Land Reforms Laws governing agricultural finance establishments.
3. Land laws and policies.
4. The Land Use Act.
5. Legal issues affecting agriculture and rural development.
7. Law of property.

**AEE 540: Agriculture in Transition (E), L30 T15, Units 2**
The impacts of agricultural changes on farm families, rural communities and consumers. Past, present and future trends in family farms and their social implications. Land Use Law and its implications for land acquisition and agricultural development. Land ownership structure in Nigeria inheritance, purchase, lease, etc.

Teaching Units:
1. The impacts of agricultural changes on farm families, rural communities and consumers.
2. Past, present and future trends in family farms and their social implications.
3. Land Use Law and its implications for land acquisition and agricultural development.
4. Land ownership structure in Nigeria inheritance, purchase, lease, etc.

D. COURSES OFFERED IN THE DEPARTMENT OF AGRONOMY (AGY)

AGY 201: Introduction to Agricultural Botany (C) L15 Units 1

Cell biology and lower plants. General structure and functions of plant cells and cellular organelles, cell division, heredity, diversity in plant cells and habitats. Morphology, characteristics, life cycle of bacteria, viruses, fungi, algae, bryophytes, lichens and pteridophytes.


Teaching Units:

1. Cell Biology and lower plants
2. General structure and functions of plants.
3. Cells, cellular Organelles, cell division and heredity.
4. Diversity in plant cells and habitats
5. Morphology and characteristics of Bacteria, viruses, fungi, algae, bryophytes, lichens and pteridophytes.
6. Life cycle of Bacteria, Viruses, fungi, algae, bryophytes, lichens and pteridophytes.
7. Morphology and taxonomy of important plants in Agriculture.
8. Community groupings of important plants in agriculture.
10. Comparatives anatomy of major plant organs (cells and tissues).
11. Photosynthesis, translocation and enzymes in plants.
12. Respiration and energy utilization in plants.
13. Water relations and mineral nutrition
14. Growth and development in plants.

AGY 202: Principles of Soil Science (C), L15 P4, Units 2


Introduction to fertilizer. Introduction to organic farming.

Teaching Units:

1. Soil origin and formation
2. Physical properties of soil such as air, moisture and temperature.
3. Soil classification and survey
4. Soil colloids and reactions
5. Soil organisms and organic matter.
6. Soil water conservation
7. Mineral nutrient and requirements of plant
8. Fertilizer in agriculture
9. Introduction to organic farming

AGY 203: Principles of Crop Production (C), L15 P45, Units 2


Teaching Units:

1. Crop production and its development
2. Principles of crop production
3. Problems and prospects of crop production
4. Importance of crop rotation
5. Cultural practices and soil conservation
6. Irrigation and drainage
7. General types and characteristic of arthropods
8. Micro-organisms and other pests affecting crops
9. Weeds and their effects on crop production
10. Pests diseases and weed control
11. Basic mendelian genetics

AGY 204: Introduction to Agricultural Physics (C), L15 Units 1

Relevance of physics of agriculture. Selected topics in mechanics, heat, optics, light, thermal physics, atomic and nuclear physics, thermodynamics and radiation and their application to agriculture. Use of measuring instruments. Surface tension, inertia, viscosity, refractive index, optical instruments, tension, energy, heat capacity, temperature, heat and work. Obscure expansions, latent heat waves, current flow as they relate to agriculture.

Teaching Units:
1. Relevance of physic of agriculture.
2. Selected topics in mechanic
3. Heat, optics, light, thermal physic, atomic and unclear physics.
4. Use of measuring instruments
5. Surface tension, inertia, viscosity, refractive index, optical instruments, tension energy heat capacity temperature heat and work.
6. Obscure expansions, latent heat, waves, current flow as they relate to agriculture.

AGY 205: Introduction to Agricultural Chemistry (C), L15 Units 1


Teaching Units:
1. Atoms, sub atomic particles, isotopes and aroagadro’s number.
2. The role concept, chemical formulae and the laws of chemical combinations.
3. Equations and calculations of state of matter gases, liquids and solids.
4. Thermodynamics, energetic and thermo-chemistry.
5. Equiliao, surface chemistry
6. Acids bases and salts, redox (electron transfer)
7. Solubility products and kineting
8. Nuclear binding, energy fission and fusion
9. Structure, bonding and interforces
10. The description of inorganic chemistry main groups and transition metals.
11. Periodic table and periodicity of the element.
12. Redox reactions, ionic covalent and metallic bonds oxidation numbers.
13. Qualitative inorganic analysis
14. Theory and practice of volumetric analysis
15. Nuclear chemistry.

AGY 206: Practical Farm Experience I (C) P45, Unit 1

General and individual farm plots (Crop/Agroforestry/Horticulture) on the Teaching and Research farm under the supervision of Farm Officers and the course Lecturer. The focus is on entrepreneurial skills development in crop agriculture, agroforestry, horticultural production and farm mechanisation.

Practical Teaching Units:

1. Group farming experience in crop agriculture, agroforestry, horticulture and farm mechanisation.
2. Individual farm operation and management.
4. Experience in soil fertility management and farm mechanisation.
5. Agricultural technology and post-harvest practices.
6. Field extension practices.

AGY 301: Production of Permanent Crops (C), L15 P45, Units 2 ,

Establishment, management, processing, storage, utilisation and improvement of tree and plantation crops such as cocoa, kola, oil-palm, rubber, coffee, citrus, coconut, cashew, sugarcane, banana, plantains and pineapples.

Teaching Units:

1. Establishment and management of tree and plantation crops such as cocoa, kola, oil palm, rubber, coffee, citrus, coconut, cashew sugarcane, banana, plantains and pineapples.
2. Processing and storage of tree and plantation crops such as cocoa, kola, oil palm, rubber, coffee, citrus, coconut, cashew, sugarcane, banana, plantains, and pineapples.
3. Utilization and improvement of tree and plantation crops.
AGY 302: Production of Arable Crops (C), L15, P45, Units 2

Establishment, management, processing, storage, utilisation and improvement of cereals, legumes, root crops, fibre crops, vegetable crops and other important annual or arable crops in Nigeria.

Teaching Units:

1. Establishment of cereals, legumes, root crops, fibre crops vegetable crops and other important annual or arable crops in Nigeria.
2. Management of cereals, legumes, root crops, fibre crops, vegetable crops, and other important annual or arable crops in Nigeria.
3. Processing and storage of cereals, legumes, root crops, fibre crops, vegetable crops and other important annual or arable crops in Nigeria.
4. Utilization and improvement of cereals, legumes, root crops, fibre crops, vegetable crops and other important annual or arable crops in Nigeria.

AGY 303: Crop Genetics and Breeding (C), L15 P45, Units 2


Teaching Units:

1. Plant improvement before Mendel.
2. Mendelian genetics
3. Principles of segregation and independent assortment
4. Sex determination and sex linkage
5. Elements of heredity
6. Genes in population
7. Genetics in crop improvement.

AGY 304: Plant Pathology (C), L15 P45, Units 2

Introduction to non-parasitic, bacterial, fungal, virus and nematode diseases of plants and stored products. Fundamentals of phytopathology, etiology, epidemiology, control and management of diseases of agricultural crops.

Teaching Units:

1. Introduction to non- parasitic, bacteria, fungal, virus and Nematode diseases of plants and stored products.
2. Fundamentals of phytopathology.
3. Fundamentals of Etiology
4. Fundamentals of Epidemiology
5. Control and management of diseases of agricultural crops.

AGY 305: Pests and Micro-organisms in Agriculture (C), L15 P45, Units 2

General types and characteristics of arthropods and micro-organisms affecting animals and crop plants. Effects of insects and other micro-organisms on crop production. Weeds and their effects on crop plants.

Teaching Units:
1. General types and characteristics of arthropods, affecting animals and crop plants.
2. Characteristics and general types of micro organisms affecting animals and crops plants.
3. Effects of insect and other micro organisms on crop production.
4. Weeds and their effects on crop plants.

AGY 306: Entomology (C), L15 P45, Units 2

Introductory morphology and physiology of insects and closely related arthropods. Biology, classification and control of animal and crop pests in Nigeria.

Teaching Units:
1. Introductory morphology of insects and closely related arthropods.
2. Physiology of insects and closely related arthropods.
3. The biology of animal and crop pests in Nigeria.
4. Classification of animal and crop pests in Nigeria.
5. Control of annual and crop pest in Nigeria.

AGY 307: Soil Physical Properties and Management (C), L15 P45, Units 2


Teaching Units:
1. Soil components, soil forming rocks and minerals.
2. Weathering and profile description
3. Soil morphology, survey, classification and mapping
4. Soil types of southern Nigeria
5. Composition of soil and classification of aggregation.
6. Soil structure and stability, porosity, soil water relations.
7. Soil and hydrology cycle
8. Soil temperation and conduction
9. Soil erosion and control
10. Soil rehabilitation

AGY 308: Soil Chemistry and Microbiology (C), L15 P45, Units 2


Teaching Units:

1. Review of basic chemistry
2. Crop growth requirement
4. Cation exchange capacity and base saturation
5. Soil acidity and liming.
6. Intensity capacity and buffering capacity factors.
7. Concept of nutrient availability.
8. Plant nutrients e.g. N.P.K, and micro nutrients.
9. Soil fertility evaluation and fertilizer recommendations.
10. Fertilizer and fertilizer application techniques.

AGY 309: Introduction to Farm Machinery (C), L15 P45, Units 2

Aims and objectives of farm mechanization. Basic mechanics. Workshop tools. Principles of internal combustion engines and electric motor. Study of farm machinery used for tillage – ploughs, harrows, cultivators, farm power transmission system. Harvesting and processing equipment (sprayers and dusters). Equipment for livestock (automatic feed conveyors, automatic poultry drinkers, feeding and watering equipment, milking and milk handling equipment, meat processing equipment). Water lifting and irrigation equipment. Surveying instruments used on the farm. Operating principles, selection and maintenance procedures of farm machinery. Farm machinery costing and records. Workshop and building materials used on the farm.
Teaching Units:

1. Aims and objectives of farm mechanization.
2. Basic mechanics workshop tools.
4. Study of farm machinery used for tillage ploughs, harrows, cultivations.
5. Farm power transmission system
6. Harvesting and processing equipment (sprayer and dusters).
7. Equipment for livestock (automatic feed conveyors, automatic poultry drinkers, feeding and watering equipment, milking and milk handling equipment, meat processing equipment).
8. Water lifting and irrigation equipment.
9. Surveying instruments used on the farm.
10. Operating principles, selection and maintenance procedures of farm machinery.
11. Farm machinery costing and records.
12. Workshop and building materials used on the farm.

AGY 310: Plant Diversity and Agro-Climatology (R) L30, Units 2


Teaching Units:

1. Morphology and anatomy of angiosperms and gymnosperms flowering plants.
2. Histology and physiology of Angiosperms and gymnosperms flowering plants.
3. Seed and fruit structure
4. Dispersal and germination
5. Plant development
6. Photosynthesis, respiration, transpiration, translocation.
7. Storage organ in plant
8. Flower structure and diversity
9. The principles, aims and scope of Agro-climatology
10. The elements and control of climate and weather
11. Dynamics of the earth’s atmosphere
12. Radiation and heating of the atmospheric moisture.
13. Dynamics of pressure and wind system.
15. Seasonal variation in temperature, daylight, radiation, rainfall, and evapo-transpiration.
16. Relationship between climate and agriculture with reference to crops, livestock, forestry, fishery, irrigation, pest and diseases.

AGY 401: Harvesting, Processing and Storage of Crops (C), P45, Units 1


Teaching Units:

1. Harvesting and processing of arable crops such as cassava, maize, cowpea, soyabean, rice, citrus, kola and cocoa.
2. Types of storage e.g. traditional, crib, silo etc.
3. Crib construction
4. Storage chemicals
5. Storage pests
6. Identification of storage pest and diseases.

AGY 402: Techniques in Arable Crop Production (C), P45, Units 1

Choice of land, land preparation – land clearing methods, ploughing, harrowing, ridging. Recommended varieties, planting, fertilizer (organic and inorganic) application. Disease, pest and weed control of cereals (maize, rice), legumes (cowpea, soyabean), tubers (cassava, yam)

Teaching Units:

1. Choice of land
3. Recommended varieties, planting and fertilizer application (organic and inorganic)
4. Diseases, pest and weed control of cereals legumes, tubers etc.

AGY 403: Production and Management of Fruit and Leafy Vegetables (C), P90, Units 2


Teaching Units:
1. Choice of land and land preparation
2. Recommended varieties of leafy vegetables, amaranthus, celosia, corchorus olitorus, solanum, varieties of fruit, vegetables- capsicum, sp, abelm oschus, solanum sp, tomato.
3. Propagation and nursery preparation, fertilizer (organic and inorganic) application.
4. Diseases, pest and weed control
5. Harvesting and storage.

AGY 404: Agricultural Meteorology (C), P45, Units 1


Teaching Units:

1. The nature of climate- agriculture relationships and the method of their investigation.
2. Practical assessment of moisture and thermal agro meteorological indices on agricultural production.
3. Effect of amount of spatial and temporal variation of precipitation (rainfall, dew, fog)
4. Isolation and photo-periodism
5. Soil and air temperature, evaporation, cloud, wind and atmospheric humidity.
6. Inter-relationships of wind shelter, moisture conservation and plant growth.

AGY 405: Crop Protection and Disease Control (C), P45, Units 1


Teaching Units:

1. Identification of major pests- insects, fungi, bacteria, viruses, and nematodes.
2. Weeds and other diseases of tropical crops and stored products.
3. Types of pesticides- insecticides, fungicides, rodenticides, bactericides, aricides and herbicides.
4. Pesticides formulations- dust, granules, Ec, WP etc.
5. Types of spraying equipment for small and large spraying exercises.
AGY 406: Techniques in Soil and Water Management (C), P45, Units 1

Soil fertility evaluation, soil conservation, land cultivation, surveying, contour bounding and irrigation.

Teaching Units:

1. Soil fertility evaluation
2. Soil conservation
3. Land cultivation
4. Surveying
5. Contour bounding and irrigation.

AGY 407: Nursery Techniques in Permanent Crop Production (C), P45, Units 1


Teaching Units:

1. Types of nursery: Peasant nursery, intermediate or temporary nursery and standard nursery.
2. Construction of a nursery, nursery materials tools and equipment.
3. Nursery techniques for annual crops
4. Nursery techniques for permanent crops such as cocoa, kolanut, cashew, citrus, mango, etc.
5. Vegetative propagation such as, root cutting, stem cuttings, air layering, grafting and budding.
6. Identification of flowers palm oil processing.

AGY 408: Farm Mechanization (C), P45, Units 1

Post harvest treatment of agricultural products. Crop processing, preservation and crop drying. Clearing and sorting, refrigeration, cold storage, packing and wrapping. Farm grain storage – location and orientation, methods and equipment. Structural requirements and construction materials. Tractors and equipment.

Teaching Units:

1. Post harvest treatment of agricultural products
2. Crop processing, preservation and crop drying
3. Clearing and sorting, refrigeration, cold storage.
4. Packing and wrapping
5. Farm grain storage - location and orientation
6. Methods and equipment
7. Structural requirements and construction materials.
8. Tractors and equipment.

AGY 409: Farm Design, Survey and Land Use Planning (C), P90, Units 2


Teaching Units:

1. Basic principles of soil classification. Soil profile study and description. Soil sampling and survey methodology
2. Soil formation, mineral and rocks in relation to soil derived. Soil forming factors
3. Assemblage of maps, use of aerial photograph map. Field survey versus grid survey. Field mapping. Soil morphological investigations
4. Laboratory determination
6. Management properties of some tropical soil
7. Soil and land capability classification for various purpose.
8. Design of farm structure.
9. Selection of materials and construction of structure.
10. Maintenance of farm building
11. Farm water supply and sewage disposal.

AGY 411: Farm Workshop Practices (C), P90, Units 2

Safety instruction. Mensuration and introduction to the use of basic workshop. Sheet metal work (welding, bracing, soldering and riveting). Wood work and machine workshop. Farm tools (hoes and cutlasses).

Teaching Units:

1. Safety instruction
2. Mensuration and introduction to the use of basic workshop
3. Sheet metal work (welding, bracing, soldering and riveting)
4. Wood work and machine workshop
5. Farm tools (hoe and cutlasses).

**AGR: 402 Report Writing (C) P45 Unit 1**

Scientific writing and farm record practices. Submission of overall report on practical year/SIWES.

Practical Teaching Units:

1. Techniques in scientific writing and record keeping.
2. Writing and submission of practical year/SIWES report.

**AGR 404: Oral Interview and Spot Test (C) P45 Unit 1**

Interactive session with students to ensure cognitive ability and psychomotor skills in agriculture and related industries.

Practical Teaching Units:

1. Oral interview/interactive session on special issues in agriculture.
2. Identification of items in agriculture and related industries.

**AGY 501: Crop Husbandry I – Cereals and Legumes (C), L15, P45, Units 2**

History, botany, economic importance, production practices including crop protection, harvesting, processing and storage of tropical grain crops.

Teaching Units:

1. History and botany
2. Economic importance
3. Production practices including crop protection harvesting, processing and storage of tropical grains crops

**AGY 502: Crop Husbandry II- Tuber and Fibre Crops (C) L15, P45, Units 2**

History, botany, economic importance, production practices including crop protection, harvesting, processing and storage of tropical tuber and fibre crops.

Teaching Units:

1. History and botany
2. Economic importance
3. Product in practices including crop protection, harvesting, processing and storage of tropical tuber and fibre crops.
AGY 504: Seed Production and Certification (C) L15, P45, Units 2.
Production, processing, maintenance of genetic purity. Certification and distribution of improved seeds. Seed storage technology.

Teaching Units:
1. Product of genetic purify
2. Processing of genetic purity
3. Maintenance of genetic purity
4. Certification and distribution of improved seeds.
5. Seed storage technology.

AGY 505: Crop Husbandry III- Forage Crops and Pasture Management (C) L15, P45, Units 2.
Adaptation and botany of native and introduced tropical forage plants, their establishment, production, utilization and maintenance in permanent and temporary pastures.

Teaching Units:
1. Adaptation of native and introduced tropical forage plants.
2. Botany of native and introduced tropical forage plants.
3. Establishment and production
4. Utilization and maintenance in permanent and temporary pastures.

AGY 506: Crop Evolution, Adaptation and Improvement (c) L15, T15, Units 2

Teaching Units:
1. Variation and sources of variation, adaptation.
3. Recommendation, natural selection, isolation mechanism.
4. Speciation, crop distribution
5. Concept of primary and secondary centres of origin.
7. Crops plants and their relatives.
8. Crop domestication
9. Crop improvement.

**AGY 507: Horticultural Crops Production (c) L15, P45, Units 2.**

History, botany, economic importance, production practices including green and nursery management, harvesting, processing and storage of selected tropical fruit, tree and vegetable crops. Hydroponics principles of orchard management of tropical plantation crops.

**Teaching Units:**

1. History, botany and economic importance of horticultural crops.
2. Production practices including green and nursery management.
3. Harvesting, processing and storage of selected tropical fruit, tree and vegetable crops
4. Hydroponics principles of orchard management of tropical plantation crops.

**AGY 508: Chemistry, Microbiology, fertility and plant Nutrition (C) L30,Units 2**


**Teaching Units:**

1. Media of plant nutrition
3. Nature of soil fertility in terms of plant nutrient supply and role in crop plant productivity.
4. Soil nutrient dynamics, macro and micronutrient requirement of crop.
5. Soil pollution and bioremediation
7. Fertilizer use management.
8. Soil organic matter
10. Ecological and agricultural implications.

**AGY 509: Fruits and Vegetables (C) L15, P45,Units 2.**

Production, handling, storage and utilization of tropical fruit crops and vegetables.
Teaching Units:

1. Production and handling of tropical fruit crops and vegetables.
2. Storage and utilization of tropical fruit crops and vegetables.

AGY 510: Techniques in field experimentation and Data Analysis (C) L15,P45, Units 2

Planning, design of experiments, especially field experiments and analysis of experimental data in crop and soil sciences. Data collection, summarization and presentation. Field characteristics and plot layouts. Field surveys, methods and problems.

Teaching Units:

1. Planning and design of experiments
2. Field experiments and analysis of experimental data in crop and soil sciences.
3. Data collection, summarization and presentation.
4. Field characteristics and plot layout
5. Field surveys, methods and problems.

AGY 511: Soil Physics and Soil Conservation. (C) L15,P45,Units 2.


Teaching Units:

1. Soil structure and soil water
2. Flow of water in saturated and unsaturated soils.
3. Poiseville’s and Davey’s laws.
4. Flow of water in heterogeneous layered medium
5. Diffusivity, moisture characteristics curve, hysterisis field water cycle.
6. Ground water drainage and soil concept.
7. Farming systems and land use in the tropics
8. Soil conservation methods
9. Farm planning for soil conservation and soil conservation policies.

AGY 512: Seminar (C), T30, Units 2
This course is designed to expose students to research methods and search capabilities. Students will be exposed to literature searches using on-line database. The student is expected to present two seminars on his/her research project at the preparatory and finishing stages as well as present at least a seminar on special topics in the area of Agronomy and Horticultural services.

Teaching Units:

1. This is to expose students to research methods and research capabilities.
2. Expose students to literature searches using on-line database
3. Students to present two seminars on project at the preparatory and finishing stages as well as on special topics in area of agronomy and horticultural science.

AGY 513: Ornamental Gardening and Landscape Horticulture (E) L30,P45,Units 3


Teaching Units:

1. Production and handling of ornamental plants.
2. Storage and utilization of ornamental plants.
3. Concept of landscaping (meaning and need).
4. Landscaping techniques.
5. Landscaping instrument and tools
6. Drainage- meaning and construction methods.
7. Trees and ornamental plants- types, production establishment and maintenance.
8. Basic principles of land survey colour map reading techniques.
9. Plants for the landscape and landscape design.
11. Residential landscape, institutions, parks, and sport grounds (groundmanship).
12. Field trips

AGY 514: Research Project (C) P180, Units 4
The student is expected to carry out a departmentally approved special project lasting about two semesters under a supervisor.

Teaching Units:

1. Special project lasting about two semesters under a supervisor

AGY 515: Weed Science, Pesticides and Pollutants (E) L30, P45, Units 3


Teaching Units:

1. Weed problem in agricultural production
2. Weed classification and weed-crop associations.
3. Management and control measures types of measures and application.
4. Use of chemical, spraying equipment, their calibration and storage of chemicals.
5. Biology and ecology of weeds.
6. Losses due to weeds and principles of weed control practices.
7. Basic herbicides selectivity.
8. Residual effects of pesticides and ants on soil, water, crops, livestock and fishes.

AGY 516: Preservation, Storage and Post harvest Physiology of Fruits and Vegetables (E) L30, Units 2

Traditional methods of vegetable processing and storage, handling of fresh cut flowers, fresh fruits and vegetables in storage. Fundamentals of storage, transportation pertaining to temperature and humidity control, protective treatment economic considerations.

Teaching Units:

1. Traditional methods of vegetable processing and storage.
2. Handling of fresh cut flowers, fresh fruits and vegetables in storage.
3. Fundamentals of storage, transportation pertaining to temperature and humidity control.
4. Protective treatment economic considerations.
AGY 517: Pests and Diseases: Development, Epidemiology and Control (E) L30,P45,Units 3.


Teaching Units:

1. Review of various pests associated with cultivated plants and stored produce in Nigeria.
2. Insects in relation to plant disease.
3. Recognition, habits, binomics and control of major pests.
4. Fundamental and practical aspects of diseases of importance to crop plants.
5. Cultural, biological and chemical control of plant diseases.
7. Quantitative and regulatory measures against introduction and spread of plant pathogens.
8. Special teaching and illustration of the development, epidemiology and control processes.


Teaching Units:

1. Soil concept structure and soil water flow
2. Flow of water in saturated and unsaturated soils
3. Flow of water in heterogeneous layered medium
4. diffusivity, moisture characteristics curve
5. Field water cycle
6. Ground water drainage
7. Soil conservation, erosion, drainage, tillage and irrigation
8. Farming systems and land use in the tropics
9. Soil conservation methods
10. Farm planning for soil conservation and soil conservation policies
AGY 519: Irrigation, Soil Survey and Remote Sensing (E) L15,T45,T15,Units 3


Teaching Units:

1. Planning of surface irrigation scheme
2. Need for commend water duty and canal discharge
3. Depth and frequency of irrigation and rotation of supply
4. Design and layout of canals
5. Irrigation structures, siphon, culverts, embankments, gates and crossing
6. Drainage cross drainage works, surface drainage systems. Ground water irrigation
7. Establishment of irrigation project, construction, operation and maintenance.
8. Water management at the farm level
9. Legal and sociological aspects of irrigation development
10. Soil survey meaning, values, purpose and types
11. Remote sensing concept and principle
12. The soil profile study and description
13. The main system of soil classification
14. Soil survey methods
15. Aeriel photographs, stereo viewing points transfer, photo interpretations
16. Land classification
17. Use and misuse of land in the tropics
18. Soil mapping

AGY 520: Soil – borne and Root Diseases of Plants (E) L15,T15,Units 2.


Teaching Units:

1. Effect of soil environment on microbial activity and root diseases
2. Soil organic matter
3. Toxic Plant residues and root diseases
4. Soil micro-organism
5. Interaction between soil micro-organisms and its effect on root diseases
6. Control of soil borne pathogens

AGY 522: Soil and Plant Analysis and Instrumentation (E) L15,P45,Units 2.

Analysis of soils and plants for major and minor elements and interpretation of data. Maintenance and operation of major analytical instruments. Evaluation of analytical errors and systems for monitoring analytical procedures.

Teaching Units:
1. Analysis of soils and plants for major and minor elements and interpretation of data
2. Maintenance and operation of major analytical instruments
3. Evaluation of analytical errors and systems for monitoring analytical procedures

E. COURSES OFFERED IN THE DEPARTMENTS OF ANIMAL SCIENCE AND FISHERIES

ANF 201: Introduction to Livestock Science and Animal Diversity (C), L15, P45, Units 2

The place of animal in agriculture. Origin, domestication and breeds of farm animals (cattle, sheep and goats) and non-ruminants (swine, poultry and rabbit). Problems of livestock production in Nigeria. Poultry anatomy and physiology.

Characteristics, classification and mode of major invertebrate and vertebrate phyla. Structure and functions of various animal systems. Introduction to histology and embryology. Interactions and origins of animals.

Teaching Units:
1. The place of animal in agriculture.
2. Origin, domestication and breeds of farm animals (cattle, sheep and goats) and non-ruminants (swine, poultry and rabbit).
3. Problems of livestock production in Nigeria.
4. Poultry anatomy and physiology.
5. Characteristics, classification and mode of major invertebrate and vertebrate phyla.
6. Structure and functions of various animal systems.
7. Introduction to histology and embryology.
8. Interactions and origins of animals.

ANF 202: Introduction to Agricultural Zoology (C) L15, P45, Units 2


Animal cells: sub-cellular structures and functions. Mammalian structure and physiology, support and locomotion (muscles, skeletal system), nutrition, respiration, transport, homeostasis, coordination and control (endocrine and central nervous system). Reproduction (structure of reproductive tract – male and female, gametogenesis, fertilization, embryo development). Diversity of animals: protozoa, coelenterate, platyhelminthic, nematode, annelids, arthropod (class insecta), mollusca, echinodermata, chordate (sub-phylum vertebrate). Emphasis should be on organisms of agricultural significance.

Teaching Units:
1. Introduction to zoology techniques.
2. General structure of animal cell.
3. Functions of animal cell and organelles.
4. Animal cell types and their properties.
5. Cell division.
7. Animal cells: sub-cellular structures and functions.
8. Mammalian structure and physiology, support and locomotion (muscles, skeletal system), nutrition, respiration, transport, homeostasis, coordination and control (endocrine and central nervous system).
10. Diversity of animals: Protozoa, coelenterate platyhelminthic, nematode, annelids, arthropod (class insecta), mollusca, echinodermata, chordate (sub-phylum vertebrate).
11. Emphasis should be on organisms of agricultural significance.
12. Legal and sociological aspects of irrigation development.
13. Soil survey – meaning, values, purposes and types.
15. The soil profile study and description.
16. The main system of soil classification.
17. Soil survey methods.
18. Aerial photographs, stereo-viewing points transfer, photo interpretation.
20. Soil mapping.

ANF 203: Anatomy and Physiology of Farm Animals (C), L15, P45, Units 2

501

Teaching Units:

1. General introduction to animal with particular emphasis on external features.
2. Histology and embryology.
3. Structure and function of various systems of animal’s body.
4. Poultry anatomy and physiology.

ANF 204: Introduction to Agricultural Biochemistry (C), L15, P45, Units 2


Teaching Units:

1. The major bio-chemical compounds – water, carbohydrates, lipids, proteins and nuleic acids.
2. Biochemical organization of the cell.
3. Ions in biochemical systems PH. buffers.
4. Intermediary metabolism-glycolysis, TCA cycle, PPP lipid oxidation, protein catabolism.
5. Electron transport system, photosynthesis, vitamins, minerals, coenzymes, etc.

ANF 206: Introduction to Fisheries and Aquaculture (C), L15, P45, Units 2

The important fishes of West Africa with emphasis on Nigerian species. Classification, evolution, morphology and basic structure of fishes. The adaptation of fish to aquatic life. Life-cycle of principal species of fishes. Significance of fishes in the lives of Nigerians. Fishing and aquaculture. The fish industry in Nigeria. Fundamental principles of fish management and production.

Teaching Units:

1. The importance fishes of West Africa with emphasis on Nigerian species.
2. Classification, evolution, morphology and basic structure of fishes.
3. The adaptation of fish to aquatic life.
4. Life-cycle of principal species of fishes.
5. Significance of fishes in the lives of Nigerians.
6. Fishing and Aquaculture.
7. The fish industry in Nigeria.
8. Fundamental principles of fish management and production.
ANF 301: Principles of Animal Production (C), L15, P45, Units 2

Management practices in ruminant and non-ruminant production including: housing, feeding, reproduction and health. Routine management practices and marketing of livestock. Production and marketing systems of livestock products.

Teaching Units:

1. Management practices in ruminant and non-ruminant production including: housing, feeding, reproduction and health.
2. Routine management practices and marketing of livestock.
3. Production and marketing systems of livestock products.

ANF 302: Animal Genetics and Breeding (C), L15, P45, Units 2


Teaching Units:

1. Historical notes.
2. Structure, properties and functions of chromosomes.
3. Mitosis and meiosis.
4. Genes, genotypes and genetic codes.
5. Some statistical methods related to breeding.
7. Epistasis, sex linkage, mutations and lethal factors.
8. Selection – methods, intensity, response and selection experiments.

ANF 303: Fish Biology (C), L15, P45, Units 2

The gross external and internal anatomy of a typical bony and typical cartilaginous fish. The different types of anatomical systems and basic functions of each system of organs in the fish. Embryology and life history of a fish with special reference to commercially important fishes e.g. tilapia, clarias, catfish and mullet.

Teaching Units:
1. The gross external and internal anatomy of a typical bony and typical cartilaginous fish.
2. The different types of anatomical systems and basic functions of each system of organs in the fish.
3. Embryology and life history of a fish with special reference to commercially important fishes e.g tilapia, clarias, catfish and mullet.

ANF 304: Livestock Feeds and Nutrition (C), L15, P45, Units 2


Practical – proximate analysis, feed analysis (microscopic examination). Introductory ration formulation.

Teaching Units:

1. Nutrition – principles of nutrition, body composition, classification and functions of nutrients.
2. Comparatives digestive processes and absorption of nutrients in ruminants and non-ruminants.
3. Factors affecting digestion and absorption.
5. Nutritional diseases) deficiencies and imbalances energy, protein, minerals, vitamins).
6. Non-nutritional problems (choking, hardware diseases, etc).
7. Poisonous plants (common poisonous plants diagnosis, prevention and treatment).
8. Types and roles of feedstuffs – pasture and range forage, hay, silage, grains (high energy feeds).
10. Feeds analysis and feed evaluation
12. Practical – proximate analysis, feed analysis (microscop ic examination).
13. Introductory ration formulation.

ANF 305: Ichthyology (C), L15, P45, Units 2

Principles of systemic. Taxonomy and detailed study of principal commercial species of Nigerian fish – inland, estuarine and ocean water invertebrates and reptiles.
Identification of species using keys and monographs. Important world species of sardine, tuna, anchornveta, etc. biological attributes of fish population. Phylogenetic relationships.

Teaching Units:

1. Principles of systemic
2. Taxonomy and detailed study of principal commercial species of Nigerian fish – inland, estuarine and ocean water invertebrate and reptiles.
3. Identification of species using keys and monographs.
4. Important world species of sardine, luna, anchorinveta, etc biological attributes of fish population.
5. Phylogenetic relationships.

ANF 306: Fish Nutrition (C), L15, P45, Units 2


Teaching Units:

1. Principles of fish nutrition.
2. Chemistry and nutritive value of various classes of fish food.
3. Nutrients requirements of fish.
4. Nutrients sources and practical considerations in fish feeding.

ANF 307: Limnology (C), L15, P45, Units 2


Teaching Units:

1. Physical and chemical properties of both inland and sea water.
2. Hydrology and water cycle.
4. Thermal properties and stratification.
ANF 308: Fish Gear Technology (C), L15, P45, Units 2


Teaching Units:

1. Study of types of gear and fishing craft.
2. Properties of the materials used in the construction of fish gears.
3. Construction of hooks, traps and nets.

ANF 309: Fish Ecology (C), L15, P45, Units 2


Teaching Units:

1. Ecology of fishes with special reference to distribution and natural history and application of the knowledge to fisheries management and obtaining maximum returns from fisheries resources.
2. Characteristics of the aquatic environment.
3. Organic production in aquatic fauna and flora alga blooms and entrophication.
4. Plankton, benthos and biomass assessment.
5. Food and feeding habit of fish.
8. Food chain.
9. Reproductive behaviour and life cycles of some selected species.

ANF 310: Fish Parasites and Diseases. (C) L15, P45, Units 2.

Identification, morphology, taxonomy, life history of fish parasites. The ecological and pathological effects of parasites and diseases of fish. Epidemiology of parasite populations in water body. Common bacterial, fungal and viral fish diseases and their control. Other enemies of fish. International restriction binding the transportation of fish across country boundaries. Fish ponds and public health.
Teaching Units:

1. Identification, Morphology, Taxonomy, Life history of fish parasites.
2. The ecological and pathological effects of parasites and diseases of fish.
3. Epidemiology of parasite populations in water body.
4. Common bacterial, fungal and viral fish diseases and their control.
5. Others enemies of fish.
6. International restriction binding the transportation of fish across country boundaries.
7. Fish ponds and public health.

ANF 311: Aquaculture (C) L30, P45, Units 3


Teaching Units:

1. Aims and types of aquaculture.
2. History, Present organisation and status of aquaculture in Nigeria.
3. Principles of aquaculture liming and pond fertilisation, food supply, growth rate and food conservations.
4. Selection of culture species, introductions of exotic species and its implications etc. with requirements.
5. Stocking, feeding and harvesting practices.
6. Fish farm design.
7. Economy considerations in aquaculture.

ANF 312: Elementary Seamanship and Navigation (C) L15,P90,Units 3.

Teaching Units:

1. Important sea terminologies.
2. Parts of a boat.
4. Coast light and light vessels.
5. Measures of distance, depth, speed etc.
6. Launching and boarding of small boats.
7. Life saving and fire fighting equipment and methods.
8. Swimming.

ANF313: Fish Farming Technologies and Hatchery Management (C) L30, P45,

Units 3.

Artisanal and commercial fishing methods and importance in fishing boats, trawlers and gears, hooks, traps and nets. Different types of fish culture techniques - monoculture, polyculture, selected breeding, intensive and extensive culture in inland and brackish water, in rice fields, and in floating cages and rafts. Gear selectivity. Electro fishing. Spawning methods. Artificial fertilization. Incubation, rearing, harvesting and transportation of fry and fingerlings. Selection and care of breeders, larvae and fingerlings. Control of physio-chemical level of water.

Teaching Units:

1. Artisanal and commercial fishing methods and importance in fishing boats,
   hawters and gears, hooks, traps and nets.
2. Different types of fish culture techniques - monoculture, polyculture, selected breeding, intensive and extensive culture in inland and brackish waters in rice fields and in floating cages and rafts.
4. Electro fishing.
5. Spawning methods.
6. Artificial fertilisation.
7. Incubation, rearing, harvesting and transportation of fry and fingerlings.
8. Selection and care of breeders, larvae and fingerlings.
9. Control of Physio-chemical level of water.
ANF 316: Water Quality Assessment and Pollution Control. (C) L15,P45,Units 3.


Teaching Units:

1. Physical composition of water.
2. Water chemistry and nutrient cycles.
3. Water quality requirement and guidelines for various uses drinking, irrigation, livestock, recreation and fishing.
4. Principles of Physio Chemical and microbiological analysis of water types of water and lithological control of surface and ground water.
6. Chemical, mechanical and biological methods of maintaining and improving water quality.
7. Water quality analysis and determination of nutritive values of ponds.

ANF 318: Fish Adaptation and Physiology (C) L15,P45,Units 2.

The different shapes and adaptive design in fish in relation to aquatic environment. Natural environmental adaptation of fish, migration, reproduction, feeding habits, salinity, temperatures and life- cycles. Modified environmental behaviour of fish to pressure, light, electrical field and noise.

Teaching Units:

1. The different shapes and adaptive design in fish in relation to aquatic environment.
2. National environment adaptation of fish, migration, reproduction, feeding habits, salinity, temperatures and life cycles.
3. Modified environmental behaviour of fish represented light, electrical field and noise.

ANF 320: Marine and Brackish Water Economic Resources (C) L15,P45,Units 2

Study of major marine and brackish water fin and shell fish species in relation to their development for culture, food and industrial uses. Methods of harvesting e.g. Electro-fishing.

Teaching Units:

1. Study of major marine and brackish water fin and shell fish species in relation to their development for culture, food and industries uses.

2. Methods of harvesting e.g Electro fishing.

ANF 322: Practical Farm Experience II (C) P45 Unit 1

Group and individual works (Livestock/Fisheries/Wild life domestication) on the Teaching and Research farm under the supervision of Farm Officers and the Course Lecturer. The focus is on entrepreneurial skills development in Livestock, Fisheries and Wildlife domestication.

Practical Teaching Units:

1. Livestock hostelling experience.
2. Management of group and individual livestock, fisheries and Wildlife domestication projects.
3. Practice on economics of production and marketing.
5. Field extension practices

ANF 401: Techniques in Ruminant, Production and Dairying (C) P4,Units 1


Teaching Units:

1. Identification and Characteristics of indigenous and exotic breeds of cattle, sheep and goat.

2. General management and feeding of ruminant animals.
3. Housing systems.


5. Record keeping.

6. Health management.

ANF 402: Techniques in Swine, Rabbits, Cane Rats and Snailery Production (C) P45, Units 1.


Teaching Units:

1. Identification and characteristics of indigenous and exotic breeds of cattle, sheep and goat.

2. General management and feeding ruminant animals.

3. Housing systems.

4. Breeding system.

5. Animal judging and selection.

6. Record keeping.

7. Health management.

8. Cane rat and snailery production practices.

ANF 403: Techniques in Poultry and Fishery Production (c) P45, Units 1


Teaching Units:

1. Breeds of chicken and other classes of poultry.

2. Egg formation and incubation.
3. Management of all classes of poultry (chicks, grow, layers, broilers, cockerels).
4. Health management.
5. Housing, processing and marketing.
6. Breeds and types of fish.
7. Management, nutrition and health.
8. Breeding (natural and artificial) programmes.

ANF 404: Pasture and Range Management (c ) P45, Units 1

Identification and characteristics of forage crops (grasses, legumes, shrubs, browse, and planets).

Teaching Units:
1. Identification and characteristics of forage crops (grasses, legumes, shrubs, browse, and planets).
2. Establishment and maintenance of pasture and range.
3. Forage preservation.
4. Silage and hay making.
5. Factors affecting forage quality.
6. Chemical and physical methods of evaluating forage.
7. Grazing systems and range maintenance.
8. Poisonous plants and animals.

ANF 405: Animal Products, Processing and Storage (c ) P45, Units 1


Teaching Units:
1. Handling of animal products.
2. Types of determination in animal products.
5. Analytical procedures in standardising animal products.
6. Flavourants, seasonings and preservation in animal products.
7. Specific project in animal products.
ANF 406: Animal Health Management (c ) P45,Units 1


Teaching Units:

2. Recognition of ill health in animals.
3. Disease prevention and control, including the use of vaccine.
4. Biological methods typed in treating animals including first aid and general nursing of animals.
5. Zoonotic diseases.

ANF 407: Fish Gear Use, Design, Production and Maintenance (C)

P90,Units 2


Teaching Units:

1. Study of types of fishing gears and fishing crafts.
2. Classification of fishing gears and crafts.
4. Properties of the materials need in the construction fish gears.
5. The design and construction of different types of gear and craft.
6. Assessment of fishing gears efficiency.

ANF 408: Practical Training and Industrial Attachment (C ) P675.

Each student will spend a semester in a relevant fish industry where he/she will put into practice all that has been learnt up to the 400 level and also gain practical exposure and experience. The student will submit a report of his/her experience and present a seminar on it after the period of attachment.

Teaching Units:
1. Each student will spend a semester in a relevant fish industry
2. Students practice all that has been learnt up to the 400 level and also gain practical exposure and experience.
3. Students will submit a report of his/her experience and present a seminar on it after the period of attachment.

ANF 409: Fish Processing Preservation and Marketing (C ) P90 Units 2.


Teaching Units:

1. The biodegradations and bio determination of fin and shell fish.
2. Spoilage indices, organoleptic assessment of quality of fish.
3. Principles of preservation, storage and processing.
4. Product development, evaluation and quality control.
5. Traditional versus modern processing and preservation techniques.

ANF 411: Fish Hatchery Management, Fingerling and Fry Production (C ) P135,Units 3.

Maintenance of hatcheries and nursery ponds. (sanitation, screening of nursery ponds, constant supply of pure water). Quarantine, segregation and matching of breeders. Spawning techniques- induced, breeding, artificial and natural sea reversal, hybridisation.

Teaching Units:

1. Maintenance of hatcheries and nursery ponds (sanitation, screening of nursery, pond, constant supply of pure water).
2. Quarantine, segregation and matching, artificial and natural sea reversal, hybridisation.

ANF 413: Aquatic Environment Survey (C ) P90,Units 2

Visual survey (reconnaissance)- purpose, location, water parameter, geology, meteorology. Survey (levelling) or topographic survey. Levelling instrument and its maintenance. Book (record) keeping.

Teaching Units:

1. Visual survey (reconnaissance) purpose, location, water parameter, geology, meteorology.
2. Survey (travelling) or topographic survey.
3. Levelling instrument and its maintenance.
4. Book (record) keeping.

ANF 415: Fish Nutrition and Fish Feed Technology (C ) P90, Units 2.


Teaching Units:
1. Nutrient requirements of fish.
2. Factors affecting nutrient requirements.
3. Chemistry and nutritive value of minerals needs in fish feeds.
4. Feed formulation for fish utilization.
5. General methods of breeding fish.
6. Various fish products development, their economic value and implication.

ANF 417: Fish Production Management Techniques and Accounting (C ) P90, Units 2.

Practical aspects of fish breeding. Techniques in cross breeding for stock improvement. Induced breeding, hypophysation techniques. Use of HCG, Carp, Pituitary and others in induced breeding. Appraisal of management structured and effectiveness of fisheries management policies. Record keeping and accounting procedures in fish farming.

Teaching Units:
1. Practical aspects of fish breeding. Techniques in cross breeding for stock improvement, induced breeding hypophysation techniques.
2. Use of HCG, Carp, Pituitary and others in induced breeding.
3. Appraisal of management Structured and effectiveness of fishers management policies.
4. Record keeping and according procedures in fish farming.

ANF 419: Fish Genetics and Breeding (C), P90, Units 2

Teaching Units:

1. Fish improvement before Mendel.
2. Mendelian genetics
3. Principles of segregation and independent assortment
4. Sex determination and sex linkage
5. Elements of heredity
6. Genes in population
7. Genetics in fish improvement.

ANF 501: Health Management of Farm Animals. (C) L15,P45,Units 2


Teaching Units:

1. Livestock hygiene and sanitary measures on livestock farms.
3. The host and its resistance. Disease prevention and control- diagnosis, treatment and general drug and ministration, vaccination programme, for different classes of livestock and other preventive measures for various livestock diseases.
4. First-Aid and general nursing of animal.
5. Ante-mortem and post- mortem inspection of animal at slaughter houses meat inspection.

ANF 502: Nutritional Biochemistry (C) L15,P45,Units 2

The molecular basis of animal production transport of substrates (glucose, amino-acid, free fatty acids) into the cells.


Practical: blood sample analysis (glucose, protein, Urea, minerals, vitamins, etc). Urine sample analysis (protein and other metabolics). Enzyme assay. Metabolic studies.

Teaching Units:

1. The molecular basis of animal production transport of substrates (glucose, amino- acid, free fatty acids) into the cells. Fat – synthesis of fatty acids, esterification, lipolysis, cholesterol and catabolism.
6. Practical: blood sample analysis (glucose, protein, Urea, minerals, vitamins, etc). Urine sample analysis (protein and other metabolics).

ANF 503: Applied Animal Breeding (C) L15,P45,Units 2


Teaching Units:

2. Cattle breeding- milk production, beef traits. Swine production live performance, carcass traits.
3. Poultry breeding- layers, boilers and other fowls.
5. Small ruminant breeding- breeding plans, growth and carcass traits.

**ANF 504: Animal Products and Processing (C) L15,P45,Units 2**


**Teaching Units:**

3. Preparing animals for slaughter, evisceration and dressing, care of carcass and care of carcass and care of hides and skin.
5. Processing and storage of meat. Milk microbiology and processing of by-products, butter, cheese, and whey. Effects of cooling on egg quality, grading, marketing and distribution of animal products.
6. Animal food products inspection and hygiene. Preservation methods in animal products and their effects on physical, chemical and acceptability properties.
7. Packaging and marketing of animal products. Practical-students should be exposed to the abattoir and meat shops.

**ANF 505: Reproductive Physiology and Bioclimatologoy of Domestic Animals (C)**

L15, P45, Units 2.

Origin, development and anatomy of male and female reproductive organs. Hormones of reproduction. Oestrus cycle- time sequence, ovarian change, tubular changes and artificial control. Oogenesis, ovulation and fertilisation, gestation, parturition, pregnancy,

Hibernation- types, advantages and physiology of hibernation. Low and high pressure from air and water. Human pollution.

Teaching Units:

5. Hibernation- types, advantages and physiology of hibernation. Low and high pressure from air and water. Human pollution.

ANF 506: Ruminant Nutrition (C) L15, P45, Units 2


Teaching Units:

1. Rumen physiology, ecology and microbiology. Metabolic pathways in protein, non-protein, carbohydrate and fat in ruminants.
3. Determination of digestion coefficient.
4. Nutrient requirements of ruminants (cattle, sheep and goats).
5. Metabolic disorders. Feed additives.

**ANF 507: Beef Cattle, Sheep and Goat Production (c) L15,P45,Units 2**


**Teaching Units:**

1. The beef and small ruminant industry. Nigerian breeds of beef and small ruminants and their physical and production characteristics.
2. Feeding and management of cattle, sheep and goat. Calf, lamb and kid rearing and finishing operations.
3. Routine management practices in cattle, sheep and goats- animal judging, and selection, record keeping, identification, castration, deworming, dipping, dehorning.
4. Handling and processing of beef cattle, sheep and goats. Production in sheep and goats. Health problems in cattle, sheep and goats.
5. Marketing of beef, goat and sheep products.

**ANF 508: Pasture and Range Management (c) L15,P45,T15,Units 3**


**Teaching Units:**

2. Environment and forage. Chemistry of forage and analytical systems of evaluating forages. Pasture seed production.
3. The utilization and maintenance of permanent and temporary pastures. Factors affecting grassland productivity.

**ANF 509: Swine and Rabbit Production (c) L15, P45, Units 2**


**Teaching Units:**

1. Swine production- types and breeds of swine,
2. Swine characteristics as they affect production.
3. Requirements for siting a pig farm.
4. Selection and development of a foundation stock.
5. General types of pig production enterprise.
6. Swine production systems. Housing requirements for swine production. Physiology of reproduction as it relates to swine production.
8. Feeds and feed requirements for successful swine production including feed processing and the role of pasture feeding. Marketing of swine and pork products.
10. Rabbit production systems. Housing requirements for rabbits.
12. Diseases of rabbit and their control.

**ANF 510: Poultry Production (c) L15, P45,T15Units 3.**

Teaching Units:

1. Poultry industry
2. Biology of the fowl
3. Breed of chicken
4. Poultry breeding
5. Egg formation, incubation and hatching management
6. Hatching egg quality.
7. Factors affecting hatchability
8. Poultry housing equipment
9. Management of chicks, layers and breeders
10. The principle of poultry nutrition.
11. The nutrient requirement of poultry
12. Poultry and diseases and parasites.
13. Waste management
14. Rearing of other classes of poultry (turkey, duck)
15. The business of poultry keeping.

ANF511: Dairy Animal Production (c) L15, P45, Units 2


Teaching:

1. Feeds of dairy cattle, sheep and goats.
2. Desirable characteristics of dairy animals
3. Feeding and management of dairy cattle sheep and goats.
4. Calf raising techniques.
5. Principles of sheep and goat management.
6. Artificial insemination methods.
7. Milk composition and factor affecting it.
8. Milking procedures and milk handling.
10. Animal judging and record keeping.
ANF 512: Seminar (c) T30, Units 2.

This course is designed to expose students to research methods and search capabilities. Students will be exposed to literature searches using on-line databases. The student is expected to present two seminars on his/her research project at the preparatory and finishing stages as well as present at least a seminar on special topics in the area of Animal Science.

Teaching Units:

1. Expose students to research methods and search capabilities.
2. Expose students to literature searches using on-line databases.
3. Student to present two seminars on research project given to them.
4. Students to present seminars on special topics in the area of Animal Science.

ANF 513: Monogastric Nutrition (C) L15, P45, Units 2


Teaching Units:

1. Comparative digestive System (review) Digestion, absorption and metabolic process in monogastric.
2. Biochemical function and metabolism of water, minerals and vitamins.
3. Evaluation of feeds and feedstuffs protein (NPN, PER, BU etc.)
4. Energy concepts, determination and factors affecting energy utilization.
5. Nutrient requirements of pigs, poultry and rabbits.
6. Feed additives.
7. Metabolic disorder e.g neonatal hypoglycemia in piglets, fatty liver syndrome in poultry, etc.
9. Ration formulation
10. Proximate analysis
11. Metabolism trials.

ANF 514: Research Project (c) P180, Units 4

The student is expected to carry out a departmentally approved special project lasting about two semesters under a supervisor.

Teaching Units:

1. Students carry out approved special projects for about two semesters under supervisor.
ANF 515: Research and Statistical Methods in Animal Science (C) L15, T15, Units 2.


Teaching Units:

1. Animal experimentation.
2. Experimental design
3. Interpretation and presentation of data.
4. Techniques in reproductive physiology and endocrinology
5. Techniques in dairy science research
6. Techniques in non-ruminant production
7. Techniques in quantitative genetics
8. Statistical tools for data analysis.
9. Basic statistical designs in animal science research problems

ANF516: Economic of Livestock Production (E) L15, T15, Units 2


Teaching Units:

1. The concept of production
2. Inputs of production
3. Role of management in agricultural production
4. The law of diminishing returns
5. Profit maximisation
6. Revenue maximizing level of production
7. Types of livestock farms
8. Cost levels.

ANF 517: Nigeria Feeds, Feeding Stuffs and Feed Analysis (E) L15, P45, Units 2.


Teaching Units:
2. Different methods of analysis and their principles
3. Techniques in digestibility estimation
4. Digestibility of energy, protein, lipids and vitamins in ruminants and non-ruminants.


Causes and recognition of diseases in animals. Responses to diseases. General problems and diseases caused by parasitic and microbial agents. Diseases caused by vitamin and internal deficiencies, especially in poultry and swine. Diseases caused by chemical agents, toxic plants, herbicides, rodenticides and insecticides, snakebites, mycotoxicosis. Diseases transmitted from animals to man and vice versa and their control. Meat hygiene. Fish diseases. Immunology.

Teaching Units:

1. Causes and recognition of diseases in animals.
2. Responses to disease
3. General problems and diseases caused by parasitic and microbial agents.
4. Disease caused by vitamin and internal deficiencies, especially in poultry and swine.
5. Diseases caused by chemical agents, toxic plants, herbicides, rodenticides and insecticides.
6. Snakebites, mycotoxicosis
7. Diseases transmitted from animals to man and vice versa and their control
8. Meat hygiene
9. Fish diseases
10. Immunology

ANF 519: Animal Traction (E) L15, P45, Units 2


Teaching Units:

1. The role and development of animal traction in Nigeria
2. Types and uses of draft animals
3. Selection and training of draft animals
4. Harvesting and implement use.
5. Management, nutrition and housing
6. Assessment of work in relation to feeding
8. Common diseases of draft animals
ANF 521: Fish Production and Management (C) L15, T15, Units 2


Teaching Units:

1. Practical aspects of handling and care of fish
2. Breeding of fish
3. Production of fingerlings and fries
4. Management of breeders
5. Buildings and equipments needed in a fishing farm.
7. Harvesting and marketing
8. Appraisal of management structure and effectiveness of fisheries management and policies.
9. Preparation of management plan for fisheries project.

ANF 522: Fishery Technology, Processing and Storage (C) L15, P45, Units 2


Teaching Units:

1. Post harvesting storage
2. Principles and methods of preservation, packaging, storage, product evaluation and quality control.
3. Estimation of nutrients in fish flesh
4. Traditional versus modern preservation techniques

ANF 523: Production of Other Marine Products (C) L15, P45, Units 2

Teaching Units:

1. Ecology, life history of crustacean and aquatic molluses.
2. Culture of shrimps, oysters, crabs, crayfish, lolosters, cockles, periwinkles, marine grasstopods, frogs, edible sea weeds and fresh water plants.
3. Deep sea shore farming of some products.
4. Processing and preservation of marine products

ANF 524: Advanced Fish Nutrition (C) L15,P45,Units 2.


Teaching Units:

1. Advanced teaching of fish nutrition
2. Requirements for energy, proteins, vitamins and minerals.
3. Ono-nutrient components
4. Feed computation and formulation methods
5. The fish industry
6. Fish pelleting
7. Fish feed habits
8. Feed evaluation
9. Practical consideration in fish feed.
10. Feed formulation
11. Feed mixing and manufacture of feed on commercial scale

ANF 525: Ornamental Fisheries and Aquatic Design (C) L15, P45,Units 2.

Ornamental fish breeding, management and nutrition. Design and maintenance of various aquaria.

Teaching Units:

1. Ornamental fish breeding
2. Management and Nutrition
3. Designs and Maintenance of various aquaria

ANF 526: Fishery Economics (C) L30, Units 2.

Teaching Units:

1. Major economic constraints in fishery development
2. Free access fishery, sustainable yield curve and total revenue curves
3. Bionomic equilibrium, factor rents, welfare economic, theory and its relevance’s to fisheries
4. Externalities in fisheries
5. Capital investment and depreciation of equipment.
6. Consumer and consumption pattern
7. Fisheries resources and right of ownership

ANF 527: Nigeria Feeds and Feeding Stuffs (C) L15, T15, Units 2

Classification of foods, feeding stuffs and feed supplements. An extensive coverage of the chemistry and nutritive value of succulent feeding stuffs, concentrate feeds (cereals and legumes). Chemistry and nutritive value of some Nigerian grasses and legume species. Consideration of methods of their biological value evaluation.

Teaching Units:

1. Classification of foods feeding stuffs and feed supplements
2. An extensive coverage of the chemistry and nutritive value of succulent feeding stuffs and feed supplements
3. Concentrate feeds (cereals and legumes)
4. Chemistry and nutritive values of some Nigerian grasses and legume species
5. Consideration of methods of their biological value evaluation

ANF 528: Water Quality Management and Pollution Control (C) L15, P45 Units 2


Teaching Units:

1. Physical composition of water bodies
2. Water chemistry and nutrient cycles
3. Sampling methods
4. Management of selected marine, brackish and fresh waters
5. Chemical, mechanical and biological methods of maintaining and improving water quality
6. Biological and ecological characteristics of polluted waters
7. Effects of pollution on fish planktons benthic, macro invertebrates, algae and water quality
ANF 529: Fish Population Dynamics (c) L15, T15, Units 2


Teaching Units:
1. Fishing efforts and catch per unit effort
2. Population estimation, age growth
3. Natality and mortality
4. Computation of yields from given recruitment
5. Stock assessment

ANF 530: Farm Management and Fishery Business Management (C) L15, T15, Units 2


Teaching Units:
1. Fish farm planning organization
2. Farm budgeting, farm growth
3. Problems of organizing and managing fish farms under experimental and peasant systems.
4. The scope of fishery business and management.
5. Types of business management. Types of business management.
6. Types of credit extended to fish farming.
7. Sources of credits and loans.
8. Marketing arrangement.
9. Fish farm record and accounting.
10. Financial management.

ANF 531: Fish Farming Engineering (C), L15, P45, Units 2

General surveying, site selection. Fresh water and brackish water pond construction. Design and construction of dykes, shisce gates, drainage facilities, tanks, ponds, pens, cages, rafts and other types of fish rearing facilities. Design of inland fish farms, pumping stations and fish hatcheries.

Teaching Units:
1. General surveying, site selection.
2. Fresh water and brackish water pond construction.
3. Design and construction of dykes, shice gates, drainage facilities tanks, ponds pens, cages, rafts and other types of fish rearing facilities.
4. Design of inland fish farms, pumping station and fish hatcheries.

**ANF 532: Fisheries Policy and Legislation (C) L15, T15, Units 2**


**Teaching Units:**

1. Fishery institutions.
2. Conservation strategies.
3. Fisheries policy and laws in Nigeria.
5. Law of the sea.

**ANF 533: Fisheries Microbiology and Pathology (C) L15,T15, Units 2**


**Teaching Units:**

2. Sensitivity test.
3. Control and therapy.

**ANF 534: Hydrobiology (C) L15, P45, Units 2**


**Teaching Units:**

1. Types of aquatic habitat.
3. Ecological adaptations to aquatic life.

**ANF 535: Research and Statistical Techniques in Fisheries, Aquaculture and Marine Biology (C) L15, T15,Units 2**
Fisheries, aquaculture and marine biology experimentation. Experimental design (CRD, CBRD, etc). Interpretation and presentation of data. Basic statistical techniques in fisheries, aquaculture and marine biology.

Teaching Units:

1. Fisheries, aquaculture and marine biology experimentation.
2. Experimental design (CRD, CBRD, etc).
3. Interpretation and presentation of data.
4. Basic statistical techniques in fisheries aquaculture and marine biology.

ANF 536: Seminar (C) T30, Units 2.

This course is designed to expose students to research methods and search capabilities. Students will be exposed to literature searches using on-line database. The student is expected to present two seminars on his/her research project at the preparatory and finishing stages as well as present at least a seminar on special topics in the area of fisheries and aquaculture.

Teaching:

1. Expose students to research methods and search capabilities.
2. Student will be expose to literature searches using on-line database.
3. Student to present two seminars on research projects.

ANF 538: Research Project (C) P180, Units 4.

Each student is required to choose and execute a research project under a supervisor. The duration of the project is about two semesters.

Teaching Units:

1. Students execute research project under a supervisor for two semesters.
2. Submit a project report to the department.