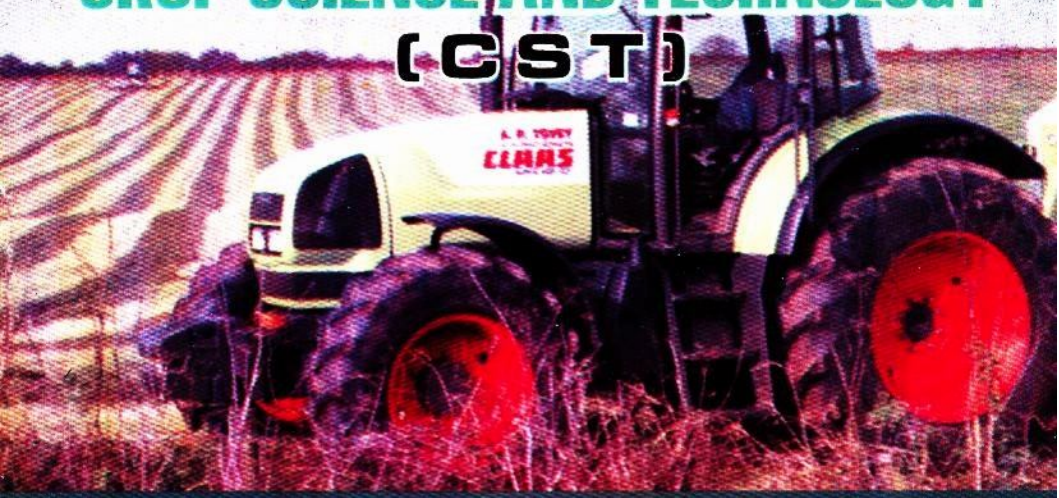
FEDERAL UNIVERSITY OF TECHNOLOGY

OWERRI, IMO STATE, NIGERIA.

Student's Handbook

of

THE DEPARTMENT OF CROP SCIENCE AND TECHNOLOGY (CST)



SCHOOL OF AGRICULTURE AND AGRICULTURAL TECHNOLOGY (SAAT)

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1.0 MESSAGE FROM THE HEAD OF DEPARTMENT

Life on planet earth is sustained primarily by the energy from the sun. Of all life forms, only plants are able to harness the energy from the sun and they subsequently make same available to other forms of life. Hence, plants are referred to as primary producers. Plants are therefore strategically positioned at the centre of sustainable life on earth. This goes to explain why the indiscriminate exploitation of plant life has made global warming a contemporary issue. Consequently proper management of plant resources has become imperative.

In the Department of Crop Science and Technology, we are concerned with the management and improvement of crops which comprise all plant life forms that are cultivated to provide food, medicine, shelter and clothing for man and his animals. Both undergraduate and postgraduate programmes are conducted in different areas of crop science including: Farming Systems; Crop Physiology; Plant Breeding; Crop Production; Horticulture; Entomology; Nematology; Plant Pathology; Weed Science. These open up a vast array of career opportunities in different spheres of the economy to students on graduation.

This handbook, which is an update of previous ones, is aimed at acquainting students in the Department with the requirements, including rules and regulations, guiding the award of degrees in the Department of Crop Science and Technology. Every student should religiously consult the "Undergraduate Regulations" which is more comprehensive in terms of rules and regulations.

Dr. I.J. Ogoke
Acting Head of Department
Department of Crop Science and Technology

2.0 PRINCIPAL OFFICERS OF THE UNIVERSITY AND DEANS OF SCHOOL

2.1 PRINCIPAL OFFICERS OF THE UNIVERSITY

VICE-CHANCELLOR
Professor C.C. Asiabaka
B.Sc. M.Sc. (Georgia), Ph.D. (Louisiana)

DEPUTY VICE-CHANCELLOR (ACADEMIC)
Professor B.N. Onwuagba
B.Sc., M.Phil., Ph.D (Nig)

DEPUTY VICE- CHANCELLOR (ADMINISTRATION)
Professor (Mrs.) R.N. Nwabueze
B.Sc. (Nig) Ph.D. (Newcastle Upon-Tyne)

REGISTRAR
Mr. Orje Ishegh-Nor MNIM, AMCIPM
B.A. (ABU), PGDM, (FUTO)

Ag. BURSAR
Mr. D.O. Nwokecha, CPA, CNA,
B.Sc, MBA

UNIVERSITY LIBRARIAN
Chief John E. Nwogu, FNLA, MNIM
Dip: Lib (Ibadan), MLS (Lough Borough, UK)

2.2 DEANS OF SCHOOL

Professor M.C. Ofoh
School of Agriculture and Agricultural Technology (SAAT)

Engr. Professor E.E. Anyanwu
School of Engineering and Engineering Technology (SEET)

Professor S.M. Nzotta
School of Management Technology (SMAT)

Professor N.N. Onu
School of Environmental Technology (SOET)

Professor I.N.S. Dozie
School of Health Technology (SOHT)

Professor F.O.U. Osuala
School of Sciences (SOSC)

Engr. Professor (Mrs.) K.B. Oyoh
Postgraduate School (PGS)

3.0 HISTORY AND PHILOSOPHY OF THE DEPARTMENT

3.1 PROGRAMME TITLE:
CROP SCIENCE AND TECHNOLOGY

3.2 A BRIEF HISTORY OF THE DEPARTMENT

Department of Crop Science and Technology started in 1982 as Crop Production Programme in the School of Agriculture and Agricultural Technology, Federal University of Technology, Owerri. Until the 1987/88 session, the students were admitted into the school and only went into their respective programme (now Departments) in the fourth year. This was so designed in order to afford all students training that will guarantee good depth in all aspects of agriculture. This is particularly so because the degree awarded is the Bachelor of Agricultural Technology (B. Agric. Tech.). Beginning from the 1987/88 academic session, the senate of the University approved the change of structure from Programmes to Departments and students were subsequently admitted into the Departments from year one.

In 1998, the Senate of the University approved the change of name to Department of Crop/Soil Science and Technology. The Department offered two-degree options namely: B. Agric. Tech. in the Department of Crop/Soil Science and Technology (Crop Science and Technology option) and B. Agric. Tech. in the Department of

Crop/Soil Science and Technology (Soil Science and Technology option). Under this arrangement, students offered common courses till final year when they elect to take courses in the major areas of crop science of soil science (options).

In 2001, the Department of Crop/Soil Science and Technology was split into two full fledged Departments namely: Department of Crop Science and Technology; and Department Soil Science and Technology.

3.3 PHILOSOPHY OF THE DEPARTMENT

Crop production remains the corner stone for a meaningful economic growth and development. The twin problems of food insufficiency and unemployment in Nigeria can to a very large extent be addressed by concerted efforts geared towards agricultural development. Our activities in the Department of Crop Science and Technology are hinged on the philosophy that the production of more and better crops will result in more sustainable life on earth. To this end, the curriculums of the Department of Crop Science and Technology are designed to enable participants at both undergraduate and postgraduate levels acquire the scientific knowledge and skills necessary for a successful career in all areas of crop production.

3.4 OBJECTIVES OF THE DEPARTMENT

The objective of the Department is to train manpower with scientific and managerial competence in crop production. Consequently graduates of Crop Science and Technology are equipped to be able to engage in research in crop science that will provide solutions to problems limiting crop production and storage. Graduates are also prepared to be able to manage crop farms.

3.5 ORGANIZATIONAL STRUCTURE

The Head of Department administers the Department through committees. The Board of Studies of the Department of Crop

Science and Technology with all academic staff as members and the Head of Department as Chairman, takes decisions on all matters in the Department that affects staff and students. All decisions are taken within the limit of the laws governing the University. Some of the committees in the Department are: Academic staff appraisal committee; Non-Academic staff appraisal committee; Examinations committee; Admissions committee; Postgraduate committee; DTLC committee; Welfare committee; Academic Books review committee. Each academic staff member belongs to one or more of these committees. In addition academic staff members also belong to School committees.

3.6 STUDENTS WELFARE

The Department appoints Class Advisers for students at various levels. A Class Adviser is assigned to register students on admission in the first year and oversee the affairs of the students until graduation. Academic grievances are handled in accordance with academic regulations. Usually a student writes to the Head of Department or other authorities through the Academic Adviser. In certain serious cases, the grievances may be processed to the senate for determination through the School Board.

The University instituted a work-to-aid scheme to assist indigent students financially. This scheme enables such students to be engaged to work part-time in some Departments/Units while at the same time attending to their studies. For this they are paid monthly stipends. Students in the Department are required to register with the Society of Agronomy Students (SOAS), and the National Association of Agricultural Students (NAAS). These two societies enhance interactions among students of Agriculture at both the University and National levels.

Students are required to meet with their class advisers regularly. Requests by students requiring the approval of Departmental Board, School Board or University Senate should be put in writing and should be endorsed by the class adviser.

4.0 HEADSHIP TO DATE

1982-1990	Prof H.O. Maduakor
1990-1992	Prof. J.C. Obiefuna
1992-1996	Prof. G.E. Osuji
1996-1998	Dr. N.A. Ozara
1998-2001	Prof. M.C. Ofoh
2001-2003	Prof. E.T. Eshett
2003-2006	Prof. M.C. Ofoh
2006-2008	Prof. C.M. Agu
2008-2011	Dr. I.I. Ibeawuchi
20011-Date	Dr. I.J. Ogoke

5.0 ACADEMIC STAFF LIST AND AREAS OF SPECIALIZATION

S/N	NAME	STATUS	QUALIFICATIONS	AREA OF SPECIALIZATION
1	Prof. J.C. OBIEFUNA	Professor	B.Sc., Ph.D.	Agronomy/Horticulture
2	Prof. M.I. NWUFO	Professor	B.Sc., M.Sc., Ph.D.	Plant pathology
3	Prof. M.C. OFOH	Professor	B.Sc., M.Sc., Ph.D.	Agronomy/ Farming Systems
4	Prof. C.M. AGU	Professor	B. Agric., M.Sc., Ph.D.	Nematology
5	Prof. N.E.S. LALE	Professor	B.Sc., M.Sc., Ph.D.	Entomology
6	Dr. I.J. OGOKE	Reader	B.Sc., M.Sc., Ph.D.	Crop Physiology
7	Dr. I.I. IBEAWUCHI	Reader	B. Agric. Tech., M.Sc., Ph.D.	Agronomy/ Ecology
8	Dr. A.E. IBE	Reader	HND, PGD, M.Sc., Ph.D.	Weed Science
9	Dr. A.A. NGWUTA	Snr. Lecturer	B.Sc., M.Sc., Ph.D.	Breeding and Genetics
10	Dr. C.T. DURUIGBO	Snr. Lecturer	B. Agric. Tech., M.Sc., Ph.D.	Agronomy/ Farming Systems
11	Dr. G.O. IHEJIRIKA	Snr. Lecturer	B. Agric. Tech., M.Sc., Ph.D.	Plant pathology
12	Dr. Miss. O.P. OBILO	Snr. Lecturer	B.Sc., M.Sc., M.Phil., Ph.D.	Plant pathology
13	Dr. Mrs. M.O. OFOR	Snr. Lecturer	B.SC., M.Sc., Ph.D.	Postharvest Pathology
14	Mr. C.T. TOM	Lecturer I	B.Sc., M.Sc.	Crop Production
15	Dr. Mrs. C.P. ANYANWU	Lecturer I	B.Sc., M.Sc., Ph.D.	Breeding and Genetics
16	Mr. S.A. DIALOKE	Lecturer I	B.Sc., M.Sc.	Entomology
17	Mr. I.N. CHIGBUNDU	Lecturer I	B.Sc., M.Sc.	Crop Production
18	Dr. G.C. ONYISHI	Lecturer I	B. Agric., M.Sc., Ph.D.	Breeding and Genetics
19	Mr. N.C. ONWUBIKO	Lecturer I	B.Sc., M.Sc.	Breeding and Genetics
20	Mr. C.O. ECHEREOBIA	Lecturer I	B. Agric., M.Sc.	Entomology
21	Mr. E.M. NWOKEJI	Lecturer I	B. Agric. Tech., M.Sc.	Plant pathology
22	Dr. K.O. OGBEDEH	Lecturer I	B. Agric. Tech., M.Sc.	Entomology
23	Dr. F.O. OJIAKO	Lecturer II	B. Agric., M.Sc., Ph.D.	Entomology
24	Mr. N.C. ADIKURU	Lecturer II	B. Agric. Tech., M.Sc.	Crop Physiology
25	Mrs. E.R. KEYAGHA	Asst. Lecturer	B. Agric. Tech., M.Sc.	Breeding and Genetics
26	Mrs. C.O. COOKEY	Asst. Lecturer	B. Agric. Tech., M.Sc.	Nematology
27	Mr. V.E. OGWUDIRE	Asst. Lecturer	B. Agric. Tech., M.Sc.	Nematology
28	Mrs. R.A. ALAGBA	Asst. Lecturer	B. Agric. Tech., M.Sc.	Horticulture
29	Mrs. N.A. OKOLI	Asst. Lecturer	B. Agric. Tech., M.Sc.	Horticulture
30	Mrs. C.A. PETER-ONOH	Asst. Lecturer	HND, PGD, M.Sc.	Horticulture
31	Mr. O. NNEBUE	Grad. Asst.	B. Agric. Tech.	Crop Physiology

6.0 NON-TEACHING STAFF

6.1 LABORATORY STAFF

S/N	NAME	QUALIFICATIONS	STATUS
1	Mr. S.O. Nti	AIST, ANIST, MNIST	Chief Technologist
2	Miss T. Onyewuchi,	HND, NIST	Lab. Technologist II
3	Mr. D. Ufomba,	WASC	Snr. Lab. Assistant

6.2 TEACHING/RESEARCH FARM STAFF

S/N	NAME	QUALIFICATIONS	STATUS
1	Mr E.G. Onyeji,	HND. PGD	Princ. Agric. Supt II
2	Mr. J.C. Nwaneri	HND, B. Agric.	Princ. Agric. Supt II
3	Mr. E. Nze	B. Agric. Tech	Farm Officer

6.3 SECRETARIAL STAFF

S/N	NAME	QUALIFICATIONS	STATUS
1	Mr. K.G. Okpe	B.Sc., M.Sc.	Admin Officer
2	Mr. U. Mbagwu	B.Sc.	Admin Officer
3	Mrs. A. Jiobi	B.Sc.	Principal Data Processor
4	Miss. J Nwachukwu	HND	Higher Executive Officer
5	Mrs. C. Ogbonna	NCE	Executive Officer
6	N. Nwuke	HND	Chief Secretarial Asst.
7	Mrs. E. N. Ibekwe	NCE	Chief Clerical Supervisor
8	B. Akujobi	NABTEB	Clerical Officer

7.0 ADMISSION REQUIREMENTS

Crop science is applied science founded on the knowledge of the natural and biological sciences. To be eligible for admission into the Department, candidates must meet the following criteria:

7.1 UME Entry

5 Credit passes at Ordinary Level in the relevant subjects which must include English, Chemistry, Mathematics, Biology or Agricultural Science, and at least a pass in Physics.

7.2 Direct Entry

Advanced level passes in relevant subjects. Candidates with HND and OND must obtain at least a lower credit in the relevant qualifying examinations. Candidates with HND are admitted and may be

required to take make-up courses or have courses waived depending on each individual's transcript.

8.0 TITLES AND CODES OF COURSES

8.1 YEAR ONE: HARMATTAN

COURSE CODE	TITLE	*L,T,P	UNITS
MTH 101	Elementary Mathematics I	3,1,0	4
PHY 101	General Physics I	2,1,1	4
CHM 101	General Chemistry I	2,1,1	4
BIO 101	Biology for Agricultural and Biological Science I	2,0,1	3
ENG 101	Workshop practice I	0,0,1	1
ENG 103	Engineering Drawing I	0,0,1	1
GST 101	Use of English	1,1,0	2
GST 103	Introduction to Logic and Philosophy	1,0,0	1
IGB 101 OR FRN 101	Introduction to Igbo Grammar Composition and Comprehension OR French Language	1,0,0	1
	TOTAL		21

*L=Number of lecture hours in one week T=Number of hours for tutorial in one week; P=Number of three hour practical in one week

8.2 YEAR ONE: RAIN

COURSE CODE	TITLE	L,T,P	UNITS
MTH 102	Elementary Mathematics II	3,1,0	4
PHY 102	General Physics II	2,1,1	4
CHM 102	General Chemistry II	2,1,1	4
BIO 104	Biology for Agricultural and Biological Science II	1,0,1	2
ENG 102	Workshop practice II	0,0,1	1
GST 102	Use of English II	1,1,0	2
GST 108	Social Science I Polity and Economy of Nigeria	1,1,0	2
GST 110	History and Philosophy of Science	1,0,0	1
IGB 102 OR FRN 102	Introduction to Igbo History, Culture and Literature OR French Language II	1,0,0	1
	TOTAL		21

8.3 YEAR TWO: HARMATTAN

COURSE CODE	TITLE	L,T,P	UNITS
CST 201	Crop Anatomy, Taxonomy and Physiology	1,0,1	2
AGR 203	Introduction to Agriculture	1,0,0	1
AST 201	Principles of Animal Production I	1,0,1	2
AGR 207	Agricultural Biotechnology	1,0,1	2
AGR 205	Agricultural Chemistry	1,0,1	2
AEX 201	Introduction to Agricultural Extension	2,0,0	2
GST 201	Nigerian and African Cultural Development	1,0,0	1
STA 211	Statistics	2,1,0	3
CSC 201	Computer Application I	2,1,1	4
	TOTAL		19

8.4 YEAR TWO: RAIN

COURSE CODE	TITLE	L,T,P	UNITS
CST 202	Tree and vegetable Crops production	2,0,0	2
CST 204	Field Crop Production	2,0,0	2
CST 206	Agricultural Climatology and Biogeography	1,0,1	2
AGR 202	Farm Practice	0,0,1	1
AGR 204	Agricultural Biochemistry	1,0,1	2
AST 202	Principles of Animal Production II	1,0,1	2
AEC 202	Principles of micro and to Macroeconomics	2,0,0	2
SST 202	Principles of Soil Science	1,0,1	2
FAT 202	Introduction to Fisheries and Aquaculture	1,0,1	2
FWT 202	Principles of Forestry Resources and Wildlife Management	1,0,1	2
SIW 200	Long Vacation Industrial Attachment	0,0,2	2
	TOTAL		21

8.5 YEAR THREE: HARMATTAN

COURSE CODE	TITLE	L,T,P	UNITS
CST 301	Crop Diseases and their Control	1,0,1	2
AGE 301	Farm Planning and Structures	1,0,1	2
AGR 303	Agricultural Genetics	1,0,1	2
AEC 301	Introduction to Farm Management and Production Economics	2,0,0	2
SST 301	Soil Chemistry and Fertility	1,0,1	2
AEC 303	Agricultural Marketing and Cooperatives	2,0,0	2
AST 301	Introduction to Tropical Animal Health	1,0,1	2
AEX 301	Community Agricultural Extension	1,0,0	1
AGR 301	Farm Practice II	0,0,1	1
ENS 301	Introduction to Entrepreneurship and Innovation	2,0,0	2
	TOTAL		18
*AGR 307	Crop and Animal Production	3,0,0	3

*For Food Science and Tech. Students

8.6 YEAR THREE: RAIN

COURSE CODE	TITLE	L,T,P	UNITS
CST 302	Crop Pests and their Control	1,0,1	2
AGR 302	Farm Practice III	0,0,1	1
AGR 304	Agricultural Statistics and Biometry	1,1,0	2
AGR 306	Processing and Storage of Agricultural Food Products	1,0,1	2
AGR 308	Geographic Information Systems in Agriculture	1,0,1	2
AST 302	Animal Feeds and Feeding I	1,0,1	2
SST 302	Soil and water Management	2,0,0	2
AGE 202	Introduction to Farm Machinery and Mechanization	1,0,2	3
AEX 302	Introduction to Rural Sociology	2,0,0	2
ENS 302	Business Creation, growth and Corporate governance	1,0,1	2
	TOTAL		20
*CST 304	Elements of Crop Production	3,0,0	3

*For Agricultural Engineering Students

8.7 YEAR FOUR: HARMATTAN

COURSE CODE	TITLE	L,T,P	UNITS
CST 401	Crop Physiology	2,0,1	3
CST 403	Plant Breeding	2,0,0	2
CST 405	Cereal and Legume Crops	2,0,0	2
CST 407	Pesticide Technology	0,0,1	1
CST 409	Disease and crop loss assessment	1,0,1	2
SST 401	Soil Genesis, Classification and Mapping	1,0,1	2
SST 407	Irrigation, drainage and hydrology	1,0,1	2
AGR 401	Farm Practice IV	0,0,1	1
MGT 405	Technical Report Writing	1,0,1	2
	TOTAL		17

8.8 YEAR FOUR: RAIN

COURSE CODE	TITLE	L,T,P	UNITS
SIW 400	4th year Rain Semester SIWES	0,0,4	4
SIW 401	4th Year Long Vacation SIWES	0,0,2	2
	TOTAL		6

8.9 YEAR FIVE: HARMATTAN

COURSE CODE	TITLE	L,T,P	UNITS
CST 501	Weeds and Weed Control	2,0,0	2
CST 503	Plant Pathology I	1,0,1	2
CST 505	Tree and Plantation Crops	2,0,0	2
CST 507	Olericulture and Pomology	2,0,0	2
CST 509	Research Techniques in Crop Technology I (Project)	0,0,2	2
CST 511	Farming Systems in the Tropics	2,0,0	2
CST 513	Post Harvest Physiology	1,0,1	2
CST 515	Field Experimentation	2,0,0	2
SST 503	Soil Survey and Land use Planning	1,0,1	2
AGR 501	Farm Practice V	0,0,1	1
	TOTAL		19

8.10 YEAR FIVE: RAIN

COURSE CODE	TITLE	L,T,P	UNITS
CST 502	Roots and Tubers, Fibre and Sugar Crops	2,0,0	2
CST 504	Pasture Management and Utilization	2,0,0	2
CST 506	Crop Genetics and Breeding	2,0,0	2
CST 508	Agricultural Entomology	1,0,1	2
CST 510	Research Techniques in Crop Technology II (Project)	0,0,4	4
CST 512	Plant Pathology II	2,0,0	2
CST 514	Crop Propagation Techniques	1,0,1	2
SST 504	Soil and Plant Analysis	1,0,1	2
	TOTAL		18

9.0 CONTENTS OF COURSES

YEAR ONE: HARMATTAN SEMESTER

MTH 101: Elementary Mathematics I (3,1,0)

Set Theory: Fields, union, intersection, complements, functions and their inverse.

Real number systems: integers, rational and irrational numbers, mathematical induction; sequences and series; arithmetic and geometric sequences and series; theory of quadratic equations, absolute values, identities, inequalities and partial fractions, permutations and combinations - binomial theorem.

Trigonometry: Circular measure, trigonometric functions and their properties, addition and factor formulae, solution of triangles.

Complex numbers: Algebra of complex numbers, the Argand diagram, De Movies theorem, nth roots of unity.

Calculus and Real Analysis: Elementary functions of a single variable and their graphs, limits and continuity. Rates of change, tangent and normal of a curve. Differentiation of elementary functions - product, quotients, functions of a function.

Implicit differentiation: Maxima, minima and points of inflection, geometrical and physical applications of the derivative, mean value theorem, parametric equations, polar coordinators. Antiderivative, integral, various techniques of integration, volume of resolution, area of surface of revolution.

PHY 101: General Physics 1 (2,1,1)

Elementary mechanics, Galilean invariance, work, energy, momentum, angular momentum, conservation laws; harmonic oscillator; rigid bodies; inverse square Saw forces; ideal fluid; heat and thermodynamics, introduction of kinetic theory of matter.

Prerequisites: O'level physics. MTH 101, MTH 102 should be taken concurrently.

CHM101: General Chemistry 1 (2,1,1)
Fundamental concepts, including atomic and molecular structure; states of aggregation of matter, acid-base reactions; homogen, nuclear chemistry, kinetic and treatment of chemical reactions in terms of acid-base concepts - physical and chemical properties, state of matter.

BIO 103: Biology for Biological and Agricultural Sciences (2,0,1)
Common life forms and processes, the nature, characteristics and diversity of living organisms, along with a general treatment of process of evolution. Cell structure and cellular metabolism including respiration, growth, and cellular transport. A general treatment of ecology and how living organisms relate to their environment and to each other.

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

ENG 101: Workshop Practice 1 (0,0,1)
General: Use of engineering measuring instruments. Callipers, gauges, etc; introduction to hand tools, e.g. practice in wood plainners, saws, sanders and pattern marking; sampling and sizing techniques of raw materials.

Sheet-metal work: Production of metal products layout, cutting and shaping, wielding, soldering, brazing, fastening and assembly.

Woodwork: Basic working principles and tools'- layout methods, cutting and shaping, finishing and evaluation; finished products.

ENG 103: Engineering Drawing 1 (0,0,1)
Introduction to the use of drawing/drafting instruments, descriptive

geometry and geometric construction. Drawing, measuring, lettering and dimensioning objects in various positions. Principles of orthographic projection in the first and third angle.

GST 101: The Use of English (1,1,0)
Use of library, use of words and sentence construction. Function of sentences - purposes structure, correct use of verbs (action words), word order and punctuation. Essay/composition writing, paragraphs - structure, function, links and style. Deposition -description and explanation. Special types of exposition, e.g. letter writing. Layout of a business letter, technical reports, including terms of reference, drafting and editing of reports.

GST 103: Humanities (1,0,0)
Introduction to the humanities, definition and rationale. Role of literature in the humanities aspects of the contemporary African novel. Significant examples of African/Western Poetry, dramatic art-role and relevance in modern Nigeria with practical demonstrations/Performances, role of philosophy in the humanities, and its quest for certainty; materialism, idealism, the meaning and significance of selected concepts: freedom, responsibility, obligation, the good life, art beauty, values -relative; inductive arguments and scientific reasoning. Exposure to African history - its role and relevance. African art and music -its history and development. Religion and the meaning of life - past, present and future.

IGB 101: Introduction to Igbo Grammar, Composition and Comprehension (1,0,0)
This course will equip the student with the basic language skills: listening, speaking, reading and writing in the approved 1961 orthography as the basics for standard Igbo.

FRN 101: French Language I (1,0,0)
This course will introduce the students to the basics of French Language such as greeting in French alphabets, vowels, pronunciation and accents. The students will also learn the components of French grammar as the article, verb, etc.

YEAR ONE: RAIN SEMESTER

MTH 102: Elementary Mathematics II (3,1,0)

Vectors and *analytic* geometry: Representation of vectors. Vectors addition, and multiplication of vector by a scalar. Components of a vector and director casines. Linear dependence and independence of vectors. Scalar and vector products of three vectors. Plane analytic geometry of the straight line, conics (circles, parabola, ellipse, hyperbola).

Differential equations: Occurrence of differential equation. Differential equations of first degree and first order, like variables, separables, exact homogenous with constant coefficients.

Statistics: Introduction of statistics. Diagrammatic representation of descriptive data. Measures of location and dispersion for discreet and grouped data. Problems of groupings and associated graphs. Introduction to probability. Sample space and events. Addition law, conditional probability and multiplication rule. Bayes Theorem. Use of permutation and combination in scatter diagram, product moment and rank correlation. Linear regression.

PHY 102: General Physics II (3,0,1)

Electrostatics, conductors and dielectrics: Magnetostatics, magnetic fields and induction, magnetic materials, Maxwell's equations; Waves and Oscillation, Electromagnetic wave; Oscillations, Optics, Modern Physics - Experimental basis of quantum physics, Planck's constant; spectra; basic phenomena of atoms, molecules sand nuclei.

CHM 102: General Chemistry II (2,1,1)

Physical and chemical equilibrium, solids solutions, reaction Kinetics and kinetic theory. Alkanes and cycloalkanes, reactions of carbon - multiple bonds; elimination and substitution, reactions of alcohols and alkyl; halides, aromatic compounds, carbonyl, compounds, organic acid and derivatives, and organic bases.

BIO 104: Biology for Biological and Agricultural Science (1,0,1)

Form and function in animals. A general classification of animals with emphasis on the characteristic morphology, and anatomy of the economically important groups, such as Mammalia, Aves, Pisces, Arthropoda, Mollusca and Nematoda. Discussion of the following excesses in animals: nutrition, excretion, reproduction, movement and confirm regulation.

ENG 102 Workshop Practice II (0,0,1)

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

GST 102: Use of English II (1,1,0)

Vocabulary, use of classical terms, word formation and affixes, special terms, acronyms, choice of correct words, definitions by examples, synonym or antonym, analytic or operational definitions, basic words in fields of specializations e.g. mechanical, electrical, civil, aeronautical, automobile engineering, metallurgy, mathematics.

GST 108: Polity and Economy of Nigeria (1,1,0)

The nature and scope of economics. The Nigerian political system; polity and means of production in Nigeria. The structure of the Nigeria economy, aspects of economic and technological dualism; internal migration - rural to urban migration and the informal sector. The role of capital in growth and development; public investment criteria choice of 'appropriate' or 'relevant' technology. Human sources development in Nigeria labour utilization, education and manpower development in Nigeria labour.

Agriculture in the development process; land tenure and reform, agricultural technology and the green revolution and integrated rural development, industrialization; role and type of industry, choice of techniques, import substitution and export expansion.

The economic role of the government expenditure and taxation; the federal structure, fiscal federalism and revenue allocation; the financial system. Problem of development planning and plan implementation in the Nigeria federal system of government. Prospects of the Nigerian economy.

GST 110: Science, Technology and Society (1,0,0)

Section A: Science and Society

Introduction: The need for science; modern scientific methods and evolution, selected key scientific research, innovations and inventions, science and culture.

Nature of Science: History of Science, classifications; science in the civilization of man; scientific evolution of man; social implications. Science and man's environment - harnessing science for production, processing, conservation, distribution and utilization of agricultural products, climate and vegetation; terrestrial and cosmic life; implications and scientific advances, e.g. population control, environmental pollution. Science and thermal energy, nuclear energy, fossils fuels, estimates of energy reserves in Nigeria' case studies of demand and supply for energy.

Section B: Technology and Society

Introduction: Technology in the development of man, role of technology in the national economy; agriculture, entertainment, transportation, communication, medicine and welfare, war and crime, etc. disciplines in technology; professional opportunities in technology in Nigeria,

Technology evolution: History of technological education and practice in Nigeria. Some key revolutions in technology, e.g. electronics and computer technology, robotics and cybernetics, and their everyday applications.

Implications of technology: Ethics in technology; implications of

technological research and advances, e.g. displacement of man by machines, space travel, threat of nuclear and neutron war, the genetic research and energy crisis, etc. Technological products liability: effects of merchandization.

Consumerism: Constraints in the utilization of new technological products - reliability, quality control and cost effectiveness, politics and environment.

IGB 102: Introduction to Igbo History, Culture and Literature (1,0,0)

This course will expose students to various aspects of human life among the Igbos as follows: Igbo world-view, Igbo culture and history, Igbo in a world of arts and civilization. It will also provide a good exposure in the area of Igbo world-view, including their social and cultural perspectives, their aspirations and amenities, as some contemporary texts will be incorporated in the study.

FRN 102: French Language II (1,0,0)

Here the students will be drilled in French grammar proper, dialogue and other oral exercises. The students will also be introduced into reading, starting with France Afrique Book 1. At the end of this course, the students should be able to speak basic French and be able to tell the time in French.

YEAR TWO: HARMATTAN SEMESTER

CST 201: Crop Anatomy, Taxonomy and Physiology (1,0,1)

Plant anatomy: plant cell structure, components and functions. Cell division. Plant tissues and their functions. Anatomy of root, stem and leaf; floral structures. Introduction to plant taxonomy. Plant specimen collection, Identification and classification. Classification systems. A brief introduction of the herbarium. Characteristics, distribution, and local examples of: Malvaceae, Dioscoreaceae, Musaceae, Graminae/Poaceae, Solanaceae, Fabaceae/Leguminosae, Compositae, etc. Enzymes. Some processes in crops: photosynthesis, translocation, pollination, respiration, energy utilization, seed dormancy and germination, development, mineral nutrition, etc. Growth regulation.

AEX 201: Introduction to Agricultural Extension (2,0,0)
The need for agricultural extension. Agricultural extension in Nigeria and the world; basic philosophy behind extension work, institutional setting for agricultural extension. Agricultural development agencies, communication and extension teaching processes, adult education principles, practical on selected oral and written communication methods and audio-visual aids (AVAs).

AGR 203: Introduction to Agriculture (1,0,0)
Definition and role of Agriculture in national economy, history of agricultural development with particular reference to Nigeria. Branches of agriculture: soil, crop, forestry, animal, horticulture economics, extension, and fishery. Career opportunities in agriculture.

AGR 205: Agricultural Chemistry (1,0,1)
Chemistry of the S-block elements and the representative block elements. Brief introduction to the chemistry of first series transition elements. Structure, reactions and functions of hydrocarbons, alcohols, phenols, aldehydes, ketones, organic acids and their derivatives. Atomic structure and bonding. Periodic table. Colloids, chemical kinetics and equilibrium. Oxidation and reduction. Acids, bases. Properties and reactions of elements of importance in agriculture.

AST 201: Principles of Animal Production I (2,0,0)
Introduction to the anatomy and physiology; Fundamentals of anatomy and physiology of the cells, cell types, tissues and organs; parts of the body of cattle, sheep and goats; breeds and breeds characteristics of cattle, sheep and goats; digestive system and functions, feeds and nutrient requirements of cattle, sheep and goats; animal behaviours, handling and restraining techniques; management of tropical ruminant animals.
Pre-requisite: BIO 101/103

STA 211: Statistics (2,1,0)

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

Pre-requisites: MTH 101 or 102.

CSC 201: Computer and Applications I (2,1,1)

Brief history of computers and computer generation. Classification of computers. Structure of a general purpose computer, number systems. The stored program. Technique of problem solving. Flowcharting, Stepwise refinement, Algorithm for sorting and merging of ordered lists. *Data* preparation. 1/0 devices. Data types. Data representations, Data capture. Problem-oriented languages. BASIC and FORTRAN programming: Logic expression; arrays: sequencing; alteration and iteration; auburograms and parameters. Elementary numerical algorithms.

Pre-requisites: MTH 101 or MTH 102

AGR 207 Agricultural Biotechnology (1,0,1)

Definition and its importance of biotechnology. History of Agriculture, ancient plant germplasm. Fermented foods and beverages. Classical biotechnology, early Microscopy, development of cell theory, nature of gene, plant and tissue culture applications, plant genetic engineering application, gene transfer methods in animals, transgenic animals and their application. Animal health, animal propagation, regulation of transgenic animals, patenting genetically engineered animals. Aquaculture: Gastropod/bivalves and crustacean production, marine animal health. Algae products and their medical potentials, anticancer and antiviral compounds, antibacterial agents, marine toxins, transgenic fish.

YEAR TWO: RAIN SEMESTER

CST 202: Tree and Vegetable Crops Production (2,0,0)

Origin and distribution of tree and vegetable crops; soil and climatic requirements of some important permanent crops such as cocoa,

banana, plantains, citrus, kola, cashew, etc; and some important vegetable crops such as fluted pumpkin, melon, Amaranthus, garden egg, etc; production practices, improvement, harvesting, utilization, processing, storage and economic aspects of some selected permanent and perennial crops.

CST 204: Field Crop Production (2,0,0)

Detailed treatment of the major field crops; yam, cocoyam, cassava, sweet potato, maize, rice, sorghum, beans, groundnut, winged beans, sugarcane, tobacco, etc. For each crop there will be detailed discussions on time of planting, site selection, land preparation, planting materials, seed rate, spacing, mulching, Ration (type, rate and frequency), crop protection (weed), and disease control), harvesting, processing and storage.

CST 206: Agric-Climatology and Bio-geography (1,0,1)

The principles, aims and scope of climatology and biogeography, The elements and controls of climate and weather and the dynamics of the earth's atmospheric radiation and heating of the atmospheric systems, atmospheric moisture, the dynamics of pressure and wild systems condensation and precipitation processes. Seasonal radiations in temperature, day length, and radiation, rainfall and evapo-transpiration equipment and maintenance of standard meteorological relation between agriculture and climate with reference to crops, livestock, irrigation, pests and diseases.

AST 202: Principles of Animal Production II (1,0,1)

Introduction to anatomy and physiology; fundamentals of anatomy and physiology of the cells, cell types, tissues and organs; parts of the body of non-ruminant animals; digestive system and functions, feeds and nutrient requirements of non-ruminant animals; animal behaviors, handling and restraining techniques management of tropical non-ruminant animals.

Pre-requisite: BIO 101/103

AEC 202: Introduction to Macroeconomics (2,0,0)

Fundamental treatment of demand and supply; theory of production, pricing and market systems, pricing and employment Sources. Introduction to different fields of Agricultural economics, farm management, production economics, marketing, It and finance, resource economics, project analysis.

SST 202: Principles of Soil Science (1,0,1)

Fundamental discussions on the distribution and classification of tropical soils: their physical, chemical and biological properties as well as their relationship to crop productivity will be dealt with.

AGR 202: Farm Practice I (0,0,1)

Students will be required to be intimately involved in the performance of various farm operations, communication and farm records skills will be taught in various operations in crop production, fisheries, forestry and poultry and non-ruminant animal husbandry techniques; semen collection and evaluation techniques; sexing, as well as the social components of technology general, dissemination and Economic analysis.

FWT 202: Principles of Forestry Resources and Wildlife Management (1,0,1)

Definition of forestry terms. Differences between forest and forestry. Renewable natural resources, availability, distribution and potentials. Grazing land, fallow lands, forests and game reserves, national parks and other conservation stands. Components of Renewable Natural Resources Plants, wildlife, water resources, forest soil, etc. Forest exploitation and utilization. Logging and log transportation. (skidding and Haulage, Road and water transportation). Sawmills and types, types of wood products. World distribution of tropical forests based on climate. Different Nigerian vegetation (forests and savannah). Nigerian wildlife species. Sustained yield management. Forest management plan and its importance in forest management. Introduction to forest ecosystem.

Stable and unstable ecosystem. Difference between forest and agro-ecosystem.

FAT 202: Introduction to Fisheries and Aquaculture (1,0,1)
Basic concepts in fisheries and aquaculture: fish, shellfish, fisheries, aquaculture, habitat related fisheries-river, lake, in shore/off shore. Exploitable fisheries resources: sardines, mackerels, shark, bonga, tuna, etc. Major fish stocks with emphasis on Nigeria. Capture techniques in natural resources exploitation: traditional peasant and modern fishing methods, fishing vessels, fishing license, regulation, EEZ, etc. Elements of stock assessment techniques: concepts of over fishing, MEI, MSY, Age/aging. Types of aquaculture, organism for culture, feeds used, financial aspects of aquaculture, present status of aquaculture.

SIW 200: Long Vacation Industrial Attachment (0,0,2)

AGR 204: Agricultural Biochemistry (1,0,1)
Cellular composition and morphology, chemistry, metabolism and synthesis of carbohydrates, lipids and proteins in plants and animals. Importance of pH and buffers. Classification and functions of enzymes and enzyme reactions.

YEAR THREE: HARMATTAN SEMESTER

CST 301: Crop Diseases and their Control (1,0,1)
Causes and control of diseases prevalent among the crops grown in the country. Topics include an introduction to the structure, life history, classification and importance of fungi, bacteria and viruses; the development and spread of plant diseases of tropical crops and stored products and their control.

AEC 301: Introduction to Farm Management and Production Economics (2,0,0)
Goals, scope and features of farm management, theory of agricultural production and resource allocation; farm records and accounting; valuation and depreciation; farm business assessment;

farm planning and control; enterprises and resource management. Applications of theory to practical situations will be strongly emphasized.

Pre-requisite: AEC 202, Introduction to Macroeconomics

AEC 303: Agricultural Marketing and Cooperatives (2,0,0)

Discussion of basic marketing concepts and interrelationships between agricultural production and marketing; approaches to the study of agricultural marketing and elements of international trade. Application of marketing principles to the identification and solution of agricultural development problems.

Pre-requisite: AEC 202, Introduction to Micro-economics

SST 301: Soil Chemistry and Fertility (1,0,1)

The chemical properties of soils in relation to plant growth. Emphasis will be placed on tropical soils. Topics include chemical composition of soils; the origin and chemistry of plant nutrients, the origin, formation and properties of clay minerals; ion exchange and nutrient absorption by plant roots; leaching of plant nutrients; influence of soil properties on nutrient absorption; inorganic fertilizers and their management; organic manure, soil acidity, soil alkalinity; soil fertility evaluation based on soil testing and plant analysis; oxidation-reduction potential.

Pre-requisite: SST 202

AGR 303: Agricultural Genetics (1,0,1)

Elaboration of the principles of Genetics applicable in agricultural production, with specific discussion on; scope and history of genetics, Mendelian fundamental principle of inheritance, including function, nature and structure of genes. Quantitative and qualitative characters and their inheritance in plants and animals; variation and measures of variation, probability, binomial distribution, chi-square, variance, standard deviation, standard error of means. Different types of gene action. Basic concepts of the genetics of population. Rudiments of selection and breeding with objective and priorities on yield, quality, resistance, adaptation, stress tolerance and mechanizability in Agriculture, introductory aspect of recombinant

DNA Technology will also be highlighted. Pre-requisites; BIO 103 and 104 Biology for Agriculture and Biological Sciences.***Pre-requisites: BIO 103 and 104, Biology for Agricultural Science I and II***

AST 301: Introduction to Tropical Animal Health (1,0,1)
Pre disposing factors in animal health (housing, nutrition, ventilation, etc). signs of good health and ill health (emphasis should be placed on current health condition). Disturbances of the body systems (digestive, respiratory, uro-genital, cardiovascular system, etc). common endo and ectoparasites of animal health importance including their distribution, transmission, specific hosts and control strategies.

AEX 301: Community Agricultural Extension (1,0,0)
Introduction to agricultural extension: Meaning, concept, philosophy and principles of agricultural extension, role of governmental and non-governmental organisations (NGOs), Agricultural Extension Service and Agricultural Innovations. Students will visit rural communities, conduct investigations into their agricultural practices and characteristics of the farm and observe development activities of formal agencies in rural areas.

AGR 301: Farm Practice II (0,0,1)
Practical illustration and a do-it-yourself involvement of students in the agricultural practices in crops, pests and diseases control, harvest, storage and processing, fertilizers and their applications. Agricultural price data collection, handling of instruments (for castration, Debeaking, dehorning, artificial insemination, etc), animal drugs and vaccines, housing, feeds and feeding and feeding techniques; and disease control techniques in farm animals.

AGE 301: Farm Planning and Structure (1,0,1)
Introduction to farmstead and farmstead problems. Consideration for size and sitting of farms. Procedure for planning the layout of

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

ENS 301: Introduction to Entrepreneurship and Innovation (2,0,0)

This course is an introductory course in entrepreneurship. Topics that will be treated include: development entrepreneurship/intrapreneurship; the Nigerian entrepreneurship environment; creativity and intellectual rights; technological entrepreneurship; innovation: theories and management; family business and succession planning; women entrepreneurship; social entrepreneurship; business opportunity set and evaluation; introduction to business strategy; introduction to business ethics and corporate governance; relationship between scientific research innovation and products; and product invention, timeliness and processes.

YEAR THREE: RAIN SEMESTER

AGR 302: Farm Practice III (0,0,1)

Practical illustration and do-it-yourself involvement of students in the agricultural practices of plant spacing and orchard layouts; manure and compost making; weeds soil conservation techniques; antemortem post-mortem inspection and slaughter house management; agricultural economics questionnaire design and conduct of interviews.

CST 302: Crop Pests and their Control (2,0,1)

The identification and control of pests of crops. Emphasis will be on pests of crops grown in .the country. Topics include introductory aspects of the structure, life history, identification of insects, nematodes and weeds; principles and methods of insect control and management; introduction to weed ecology and control; the major basis and parasitic nematodes of tropical crops and storer products.

AEX 302: Introduction to Rural Sociology (2,0,0)
Basic principles, concepts of rural sociology and understanding of rural situations. Importance of rural institutions, social processes and changes in rural areas. Leadership and community power structure. Various agricultural extension and rural sociological communication strategies and their uses.

AST 302: Animal Feeds and Feeding I (1,0,1)
Definition, importance, digestion and absorption of nutrients. Common tropical feedstuffs. Energy and protein feeds. Practical demonstration of techniques of feed milling.

SST 302: Soil and Water Management (2,0,0)
The general principles of managing soils for the optimum production of crops. Emphasis will be on the application of these principles in the management of tropical soils. Topics include an elementary treatment of causes (wind and water) and control (cultural methods) of erosion; methods of land clearing in the forest and savannah manures, crop rotation, and fallows in the maintenance of organic matter and improvement of other soil properties. Role of no-till farming on soil improvement of other soil properties. Role of no-till farming on soil improvement, soil compaction and root growth, management of soil acidity; management of low native soil fertility, moisture needs of crops, soil-water-plant relationships, irrigation water application, timing of irrigation; methods of irrigation water application, timing of irrigation; methods, of irrigation; drainage.
Pre-requisite: SST 202

AGR 304: Agricultural Statistics and Biometry (1,1,0)
Introduction to simple linear models in agricultural research, and their utilization in the design and analysis of farm experiments. Particular emphasis will be placed on the formulation of appropriate experimental designs and analysis of variance and covariance for completely randomized designs; randomized block designs, design and factorial experiments. Estimation of variance components, regression and correlation coefficients and simple test statistics will be discussed. Recent advances in Bio-statistics will be highlighted

as well as introduction to the development of computer-assisted capability for analysis of farm data.
Pre-requisite: STA 211

AGR 306: Processing and Storage of Agricultural products (1,0,1)
Scope, type, handling and processing of livestock, poultry, fish and crop products, animal slaughter and carcass handling, preservation and poisoning principles. Machinery involved in processing of major agricultural food products of animal and plant origin. Food packaging-types of packages, vacuum packaging and modified atmosphere packaging.

AGR 308: Geographic Information Systems In Agriculture(1,0,1)
Introduction to Geographic Information Systems (GIS). Terminologies and concepts in GIS. GIS input methods; GPS, Remote Sensing, Digital information system and data bases, spatial analysis and image processing. Applications of GIS in different aspects of agriculture

AGE 302: Introduction to Farm Machinery and Mechanization (1,0,2)
Short review of the development of agricultural machines. Historical development of tractor types, makes and features. Principles of operation and adjustment of tractors. Uses in various farm operations. Tractor hitch, linkage and control. Types of drive and power transmission. Introduction to field implements, their uses and modes of operations.

ENS 302: Business Creation, growth and Corporate governance (1,0,1)
Students will be introduced to the concept of business and new value creation, and theories of growth. Other topics to be discussed include: business strategy; sources of capital; principles of marketing; business ethics and social responsibility; opportunity sets and expansion considerations (E-commerce, E-business, E-trade); the scientist/engineer as an entrepreneur' opportunities and

challenges; managing transition (start up, growth); basic accounting literacy; feasibility and viability studies including issues in cash flow analysis; crafting business plans; corporate governance and change management.

YEAR FOUR: HARMATTAN SEMESTER

CST 401: Crop Physiology (2,0,1)
Physiology principles related to growth of crop communities. Crop stand photosynthesis, sink/source, relationships and assimilate redistribution in the plant. Topics include physiology under field conditions, leaf area, light interception, plant morphology and root functions; Effects of environmental factors (light intensity and quality, photoperiod, temperature, H_2O, Soil, CO_2, etc) on growth, development and yield of crop. Regulations of growth and development by endogenous growth regulators. Nutrient uptake and utilization. Growth analysis.

CST 403: Plant Breeding (2,0,0)
Patterns of evaluation of cultivated crop plant species. Reproduction of cultivated plants; plant introduction and domestication; Breeding methods for self and cross pollinated crops, systems of pollination control in crop plants; polyploidy, interspecific hybridization; mutation breeding for pest resistance.
Pre-requisite: AGR 303.

CST 405: Cereal and Legume Crops (2,0,0)
Survey of the origin and distribution of important cereal and legumes in the country. History, botany, climate and soil requirements, production practices, management, harvesting and storage; economic importance.
Pre-requisite: CST 204.

CST 407: Pesticide Technology I (0,0,1)
Properties of pesticides and their utilization in pest management system formulations and application methods, environmental hazards and their regulation.

CST 409 Disease and Crop Loss Assessment (1,0,1)

Plant disease epidemics - epidemics, epidemiology and epidemics versus epiphytotics. Plant disease intensity – severity versus incidence. Measurement levels and random variables – random variables and plant disease variables. Assessing disease intensity – incidence, counts and severity; visual assessment of disease severity; direct estimation, direct estimation with the use of disease scales. Attributes and properties of the crop; leaf area index.

SST 401: Soil Genesis, Classification and Mapping (1,0,1)

A discussion of the main soil forming factors and processes especially in Nigerian soils. Principles of soil classification and classification system. Soil survey, interpretation and plant capability classification. Types and interpretation of maps; mapping units and mapping. Soils of Nigeria and Imo State. Practical will include study of soil monolites in the lab; profile description in the field and exercises in soil surveys.

SST 407 Irrigation, Drainage and Hydrology (1,0,1)

Definition, historical development and scope of hydrology. Hdrological cycle and hydrological equation. Precipitation, water losses, evaporation, evapo-transpiration, infiltration, soil moisture interception. Stream flow movement, run-off and hydrograph analysis. Flood estimation and control, ground water, water management and river.

MGT 405: Technical Report Writing (1,0,1)

Introduction to principles of effective communication, principles of technical writing, organization and presentation of technical reports, feasibility studies, technical proposals, technical description and instructions, technical correspondence, oral presentation of technical ideas, technical aids in presentation and practical application.

AGR 401: Farm Practice IV (0,0,1)
Practical illustration and a do-it-yourself involvement of students in the agricultural practices of dry season vegetable production, irrigation water management, beef and dairy cattle production, hay and silage making, pasture management and utilization.

YEAR FOUR: RAIN SEMESTER

SIW 400	4th year Rain Semester SIWES.	**(0,0,4)**
SIW 401	4th Year Long Vacation SIWES	**(0,0,2)**

YEAR FIVE: HARMATTAN SEMESTER

CST 501: Weeds and Weed Control (2,0,0)
Identification and classification of weed: mechanisms of survival in annual and perennial weeds: interaction and competition between crops and weeds; principles and methods of mechanical; biological and chemical and integrated control of weeds.

CST 503: Plant Pathology I (1,0,1)
The development and spread of plant diseases, host, pathogen and environment relationships and disease physiology; diseases of selected tropical crops. Principles and methods of disease control. Practicals will include study of plant diseases in the laboratory and field.
Pre-requisite: CST 301.

CST 505: Tree and Plantation Crops (2,0,0)
Origin, distribution and importance of tree crops. Site selection; climate and soil requirements; cultural operations; nursery and field management; harvesting; processing and storage of the products of the major tree crops - oil palm, cocoa, rubber, kola, cashew, coffee, tea, coconuts, and other indigenous plantation crops. Post harvest physiology of fruits of tree and plantation crops.

CST 507: Olericulture and Pomology (2,0,0)
History, definition, classification and importance of vegetable crops

and fruit trees (including important hibiscus sp., pumpkins, solanum sp., capsicum sp., allium, amaranths, citrus sp., Musa sp., pineapple, pawpaw, *et cetera*. Ecological distribution of vegetable and fruits in Nigeria. Varieties and adaptation of exotic vegetables and fruits to the Nigerian environment and systems of vegetable and fruit production. Production practices, harvesting, handling, processing, storage, marketing and utilization of vegetables and tropical fruit crops. Methods of plant propagation Nursery systems, diseases, and pests of vegetables and fruit crop. Horticultural machines and equipment principles of producing, planting, maintaining ornamental trees, shrubs, perennials and fruits in nursery, home and parks.

CST 509: Research Technique in Crop Technology I (Project) (0,0,2)
Supervised Research into chosen problem in Agriculture.

CST 511: Farming Systems in the Tropics (2,0,0)
Systems concept in Agriculture and Farming Systems; Holistic approach in farming systems. Hierarchy, components and characteristics of a farming system; schematic diagram of a farming system; classification of farming system and major criteria; peculiarities of tropical environment and resultant cropping system; sustainable farming systems (multiple cropping, inter cropping, Agro-forestry and the various types; Alley farming; strip, contour and terrace farming; compound farming; urban agriculture and land use).

CST 513 Port Harvest Physiology and Storage (2,0,0)
Biological factors involved in deterioration – respiration, ethylene production, compositional changes, growth and development, transpiration, physiological breakdown; environmental factors influencing deterioration – temperature, relative humidity, atmospheric composition, ethylene, light, other factors. Product maturation and maturity indices. Harvesting systems. Preparation for fresh market – fruits, vegetables. Automation trends in packaging house operations, cull utilization. Packages for fruits and vegetables; cooling fruit and vegetable commodities; storage systems, modified

atmospheres and low-pressure systems during transportation and storage; ethylene in postharvest technology.

CST 515 Field Experimentation (2,0,0)

Purposes of experimentation. Definition of terms: treatment, experimental unit/plot, standard error, experimental error, standard deviation, randomization. Setting of hypothesis. Type I error, Type II error. Sampling and Data collection. Chi square. Experimental designs: one-way classification, two way classification, Latin square, factorial experiments, Split-plot. Mean separation (LSD, DMRT, etc). Simple correlation and regression. Result presentation and interpretation

AGR 501: Farm Practice V (0,0,1)

Farming internship. Students will be assigned specific and detailed on-farm jobs in their respective programmes. The execution will require the integration of all the on-the-farm skills acquired from al the previous farm practice courses.

SST 503: Soil Survey and Land-Use Planning (1,0,1)

Basic principles of soil classification; soil profile, study and description, soil survey methodology; soil farming, minerals and rocks in relation to soil derived thereof, soil roaming factors; assemblage of maps, photo; use of aerial photographs, topographic maps; field survey versus grid survey; field mapping; soil morphological investigations, laboratory determination; soil correlation, soil survey report writing; interpretative report; soil classification management properties of some tropical soils and land capability classification for various purposes. The use and misuse of land in the tropics.

YEAR FIVE: RAIN SEMESTER

CST 502 Roots, Tubers, Fibre and Sugar Crops (2,0,0)

Soil and Climatic requirements; growth requirements weed and

control and water use, improved varieties; processing; storage, marketing and utilization of field crops. Growth requirements of roots and tuber, sugar and fibre crops, etc. management and field production of the crops. Fertilization, water use and weed control.

CST 504: Pasture Management and Utilization (2,0,0)
The ecology, morphology, growth, development and production of the major legumes and grasses of Nigeria; they include Cynadon, Gamba, Elephant, Guinea, Centrosema, Pueraria, Calopogonium, etc. Modern methods of management utilization, carrying capacity, palatability and acceptability, system of grazing and preservation will be considered.

CST 506: Crop Genetics and Breeding (2,0,0)
Significance of reproductive system in cultivated plants; sexual and asexual reproduction. Techniques and principles of crop germplasm bank; role of plant breeding in pest and disease control in crop; selection methods in breeding programmes; maintenance of breeding stock; multiplication and distribution of improved varieties.

CST 508: Agricultural Entomology (1,0,1)
Principles and methods of insect control and past management, survey of pesticides - formulation application, hazard, effectiveness, more of action, risks, ecological side effects, selectivity, specificity and resistance. Practical will include morphological examination and identification of insect pests of common crops, identification, formulation and application of chemicals used for control of the insects.
Pre-requisite: CST 302.

CST 510: Research Technique in Crop Technology II (Project) (0,0,4)
Continuation of supervised Research. Data analysis, preparation and oral defense of project report.

CST 512 Plant Pathology II (2,0,0)
The impact of ecology on plant disease. Plant disease epidemics, yield and crop loss terminologies. Disease assessment and

prediction of crop losses. Effects of crops and cropping regimens on pathogen populations, density, aggregation and dispersal.

CST 514 Crop Propagation Techniques (1,0,1)

Sexual propagation. Media for propagation. Factors affecting germination, techniques of seed propagation. Vegetative propagation. Genetic variation in asexually propagated plants, mutation and chimeras. Anatomical and physiological basis for propagation by cuttings, stem, leaf, roots. Factors affecting regeneration of plants from cuttings. Mist propagation. Grafting/budding. Scion relationships. Types and methods of grafting/budding.

SST 504: Soil and Plant Analysis (1,0,1)

Soil and plant sampling and sample preparation. Theories and procedures for chemical analysis of soil and plant materials. Analysis of soil and plant for major element and the interpretation of data; determination of pH; principles of instrumentation. Maintenance and operation of major analytical instrument: flame photometers, calorimeter, spectrophotometer; photometers, amino acid analyzer; IRV; UVR; pH meters; conductivity bridge, gas system for monitoring analytical procedures, feature and function of soil testing laboratory.

10.0 UNIVERSITY WEIGHTING SYSTEM

The University operates Courses Unit System whereby units are assigned to courses for the purposes of evaluation. The units of a course are determined by the contact hours earmarked for Lecturers (L), Tutorials (T), and Practical (P). A one unit course designated as (1,0,0) means that the course has one contact hour per week for lectures (one-hour lecture) for the fifteen weeks in a semester. A two unit course designated as (1,0,1) means that the course has one contact hour per week for lectures, and a three-hour practical per week for the 15 weeks of a semester. Therefore, a course of one unit lecture and one-unit practical has 15 hours of lectures and 45 hours of practical in a semester (fifteen weeks). All students are required to register for and take a minimum of 15 units in a semester. A maximum of 21 units per semester may be registered or 24 units if a student has

a previous Cumulative Grade Point Average (CGPA) of at least 3.00. The Cumulative Grade Point Average (CGPA) is used for evaluating student performance from semester to semester.

11.0 PERFORMANCE ASSESSMENT

A student's performance in a course is evaluated using continuous assessment that involve 30% test and 70% examination for non-laboratory based courses, or 20% test, 20% lab and 60% examination for Laboratory based courses. Scores ranging from 0-100% scale are graded from F to A with a corresponding 0-5 grade point as follows:

% SCORE	GRADE	GRADE POINT	EQUIVALENT
70-100	A	5	Excellent
60-69	B	4	Very good
50-59	C	3	Good
45-49	D	2	Pass
40-44	E	1	Poor pass
00-39	F	0	Fail

A student who in first year registered for and made the following grades in the first semester will have his results computed as follows:

Course	Unit	Grade	Grade Point	TGP (Units x Grade Point)
MTH 101	4	A	5	20
PHY 101	4	C	3	12
CHM 101	4	F	0	0
BIO 101	3	A	5	15
ENG 101	1	D	2	2
ENG 103	1	E	1	1
GST 101	2	B	4	8
GST 103	1	D	2	2
IGB 101	1	B	4	4
	Total Unit (TNU) = 21			TGP= 64
	Grade Point Average = TNU/TGP =64/21 =3.05			

If in the second semester of the first year the student registered for and made the following grades his results will be computed as follows:

Course	Unit	Grade	Grade Point	TGP (Units x Grade Point)
MTH 102	4	A	5	20
PHY 102	4	A	5	20
CHM 102	4	A	5	20
BIO 104	2	F	0	0
ENG 102	1	E	1	1
GST 102	2	D	2	4
GST 108	2	B	4	10
GST 110	1	E	1	1
IGB 102	1	C	3	3
	Total Unit (TNU) = 21			TGP= 79
	Grade Point Average = TNU/TGP =79/21 =3.76			

At the end of the second semester, the student's performance is determined by calculating the Cumulative Grade Point Average (CGPA) as follows:

$$\text{Cumulative Grade Point Average (CGPA)} = \frac{(\text{First Semester TGP} + \text{Second Semester TGP})}{(\text{First Semester TNU} + \text{Second Semester TNU})}$$

$$= \frac{(64 + 79)}{(21 + 21)}$$

$$= \frac{(143)}{(42)}$$

$$= 3.40$$

Note that for each semester's results (till the final semester), the CGPA will be obtained by:

(i) adding the semester's TGP to all previous semesters' TGP;

(ii) adding the semester's TNU to all previous semesters' TNU; and

(iii) divide (i) by (ii).

Being able to calculate your CGPA for each semester will enable you work harder to improve on your performance. It is also advisable that

in each session you endeavour to register courses you failed or did not do in the previous session.

At the end of a student's last semester in the university, the class of degree he/she is awarded depends on his/her CGPA. The classes of degree awarded based on CGPA are as follows:

CLASS OF DEGREE	CUMULATIVE GRADE POINT AVERAGE
1st Class Honours	4.50 – 5.00
2nd Class Honours (Upper Division)	3.50 – 4.49
2nd Class Honours (Lower Division)	2.40 – 3.49
Third Class Honours	1.50 – 2.39
Pass	1.00 – 1.49
Fail	0.00 – 0.99

12.0 CAREER OPPORTUNITIES

Students in the Department are exposed to practical training in all areas of agriculture and particularly in crop science. This affords graduates a very competitive advantage in the field of agriculture. Graduates can therefore find career fulfillments as research scientist in both national and international agro-based research institutes. Graduates of crop science are relevant in agricultural departments of Banks which are involved in the financing of agricultural projects. Agro-based industries including commercial farms, food processing, fertilizer companies, and agricultural Departments of some oil companies offer opportunities for graduates of crop science.

Graduates of crop science may pursue civil service career as Agricultural Officers in the Federal or State Ministries of Agriculture. They can also work in states' Agricultural Development Programme (ADP) and other World Bank assisted agricultural projects. Graduates can also be employed to teach Agricultural Science in Secondary Schools, Colleges of Agriculture, and Polytechnics. Graduates with good class of degree can also be employed as a Graduate Assistants in any University offering Degree in Agriculture.

Students in the Department of Crop Science and Technology receive training in general agriculture and various aspects of crop science including Plant Breeding, Agronomy, Crop Physiology, Weed Science, Entomology, Plant Pathology, Horticulture, Agro-climatology. Coupled with courses in entrepreneurship, graduates are prepared to be self-employed and consequently create jobs.

Dr. I.J. OGOKE
Acting Head of Department
Department of Crop Science and Technology

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