



**WESLEY UNIVERSITY ONDO
COLLEGE AGRICULTURE, FOOD SCIENCE AND
TECHNOLOGY**

PROSPECTUS

(UNDERGRADUATE DEGREE PROGRAMMES)

2022 - 2026

FOREWORD

On behalf of all members of Staff of the college, it is my great pleasure to welcome you to the College of Agriculture, Food Science and Technology of Wesley University Ondo.

The college was created as part of the founding college in 2008/2009 academic session. The College is focused and innovative in its operations so as to enable it meet both local and international demands. The main objective is to produce graduates with appropriate practical knowledge and skills in the field of Agriculture, Food Science and Technology. Graduates that will be able to create employment opportunities for themselves and other people particularly in the field of Agriculture, Food Science and Technology. The graduates will be equipped to assume leadership positions and improve on the well-being of humanity.

Furthermore, the college has many seasoned academics that are highly competent and specialized in various aspects of Agriculture, Food Science and Technology. There are areas of specialization within the confines of the discipline itself and all these provide opportunities for students to actualize their life-long goals.

The academic and non-academic staff of the college have a tradition of good relationship with students and are always eager to assist students, on the other hand, students are encouraged to relate with their academic advisers for clarification on any area of concern.

This prospectus will acquaint you with the necessary information about the college

Thank you.

Prof. G.A. Fayenuwo

Dean, College of Agriculture Food Science and Technology

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LIST OF ACADEMIC SATFF

S/N	NAME	QUALIFICATI ON	SPECIALIZATION	APPOINTMEN T	RANK
1.	PROF. S.S. OBEKA	PH.D.	GEOGRAPHY	FULL-TIME	PROFESSOR
2.	PROF. G.A. FAYENUWO	PH.D.	CROP/FORESTRY	FULL-TIME	PROFESSOR (DEAN)
3.	PROF. B.O. OGUNBAMERU	PH.D.	AGRICULTURAL ECONOMICS AND EXTENSION	CONTRACT	PROFESSOR (HOD)
4.	DR. A. FALAYI BABATOPE	PH.D.	FISHERIES	CONTRACT	ASSOCIATE PROFESSOR
5.	DR. A.A. OLAJIDE	PH.D.	PLANT BREEDING/ GENETICS	FULL-TIME	SENIOR LECTURER
6.	DR. O.O. OYELEYE	PH.D.	ANIMAL PHYSIOLOGY AND BIOCHEMISTRY	FULL-TIME	SENIOR LECTURER
7.	DR. (MRS.) O. M. OGUNREWO	PH.D.	SOIL MICRO BIOLOGY	FULL-TIME	SENIOR LECTURER
8.	DR. O.Z AREGBESOLA	PH.D.	ENTOMOLOGY	FULL-TIME	SENIOR LECTURER
9.	DR. E. O. OYEKANMI	PH.D.	PLANT PATHOLOGY	FULL-TIME	SENIOR LECTURER
10.	DR. S. A. BAMIDELE	PH.D.	ANIMAL NUTRITION	FULL-TIME	LECTURER II
11.	DR. L.A. OYEBODE	PH.D.	AGRICULTURAL EXTENSION	FULL-TIME	LECTURER II
12.	DR. P. AYEKU	PH.D.	FISHERIES	FULL-TIME	LECTURER II
13.	DR. P. T. OWOMBO	PH.D.	AGRICULTURAL ECONOMICS	FULL-TIME	LECTURER II
14.	MR. T.J. FALOWO	M.Sc.	ANIMAL BREEDING AND GENETICS	FULL-TIME	LECTURER II
15.	MR. G. T. OJOLO	M.Sc.	AGRIC. ENGINEERING	FULL-TIME	ASSISTANT LECTURER

LIST OF TECHNOLOGIST / SUPPORT STAFF

S/N	NAME	QUALIFICATION	SPECIALIZATION	APPOINTMENT	RANK
1.	MR. T. K. ADEWUMI	M.Sc.	SOIL SCIENCE	FULL TIME	AGRIC OFFICER II
2.	MR. F. UDOH	M.Sc.	FISHERIES	FULL TIME	TECHNOLOGIST
3.	MR. S. AKINSANMI	B. TECH	CROP	FULL TIME	AGRIC. TECH.
4.	MR. A. OYELADE	PGD	ASST. CHIEF TECHNOLOGIST	CONTRACT	ENVIRONMENTAL SCIENCE
5.	MR. J.O. IMOYERA	B. Sc.	TECHNOLOGIST	FULL TIME	TECHNOLOGIST II
6.	MR. OLATUBI AKINOLA	HND	STO (AGRIC.)	FULL TIME	ANIMAL PRODUCTION
7.	MR. A.S. ADEGBOLA	HND	CHEMISTRY	FULL-TIME	SNR TECHNOLOGIST I
T	MR. AYODELE ABAYOMI	HND	PERSONAL SECRETARY II	FULL-TIME	SECRETARIAL ADMINISTRATION
9.	MR. S. TALABI	SSCE	AGRICULTURE	CONTRACT	FIELD OFFICER
10.	MR. T. OGUNMOLA	SSCE	AGRICULTURE	CONTRACT	FIELD OFFICER
11.	MR. S. BASHIRU	SSCE	AGRICULTURE	CONTRACT	FIELD OFFICER

INTRODUCTION

The Department offers robust academic programmes in Agricultural Economics and Extension, Animal Science, Crop/Soil Science, and Fisheries Management and Aquaculture.

PROGRAMMES IN THE DEPARTMENT

All the Programmes offer same course outline from 100 to 400 Level and the 500 Level is meant for specialization in respective programmes except Fisheries Management and Aquaculture.

a. Bachelor of Agriculture (Agricultural Economics and Extension)

Philosophy

The Bachelor of Agriculture Degree in Agricultural Economics and Extension is aimed at producing graduates with requisite knowledge, skills and attitude in agriculture and agricultural development process along with advancing frontier of agricultural knowledge through teaching, research and extension.

Objectives

The programme is tailored to train undergraduates broadly in the field of agricultural production with emphasis on Agricultural Economics and Extension.

UNDERGRADUATE ADMISSION REQUIREMENTS

Admission into the Department is open to all, irrespective of sex, race, religion or creed. Prospective students of the Department shall satisfy the following requirements to qualify for admission into the University. All admission onto the Department shall be through Joint Admission and Matriculation Board

a) General Admission Requirements

- i.** For admission into level (UTME), candidates should have:
 - a)** Ordinary level credit passes in five (5) WASCE/GCE/NECO subjects at not more than two sittings including English Language, Mathematics, Chemistry and Biology or Agricultural Science, and any other Science or Social Science subject.
 - b)** Score above the JAMB official pass mark in UTME in relevant subjects for the proposed programme of study. Holders of Pre-Degree qualification of the University are also eligible for admission.
- ii.** Direct Entry Mode (200-Level), candidates should have:
 - a)** satisfied the above minimum O'level conditions (5 credit passes in WASCE/GCE/NECO) for admission to degree options in the Department, and in addition have passed at the General Certificate of Education Advanced Level or its equivalence in Chemistry and in at least one science or social science subject from the following: Biology, Botany, Zoology, Mathematics (Pure and Applied), Agricultural Science, Physics, Geology, Economics and Geography;
 - b)** satisfied the above minimum O'level conditions for admission to degree options in the Department and in addition have obtained the National Diploma (ND) in the field of Fisheries with a minimum of **upper credit** (60-69%). The ND must be obtained from Schools and Colleges accredited by the National Board for Technical Education (NBTE) and recognized by the University;

- c) satisfied the above minimum O'level conditions for admission to degree options in the Department and in addition have obtained the National Certificate of Education (NCE) with a minimum of **credit grade** (60-69%) from a Nigerian College of Education recognized by the University, and with relevant subject combinations from among: Agricultural Science, Biology, Botany, Zoology and Chemistry;
- d) obtained the minimum O'level credit passes as set out above and in addition have obtained the Higher National Diploma (HND) with a minimum of upper credit (60-69%) in relevant fields (as listed above) and from Schools or Colleges accredited by the NBTE and recognized by the University. The candidate so admitted with HND certificate will be exempted from the 12-month practical programme observed at 400 level. However, the candidate shall benefit from the exemption only if he/she is admitted into the programme that relates to the area of his or her HND specialization;
- e) candidates are accepted on Transfer into the Department only at 200level if he has satisfied the UME entry requirement into the Department and has not been withdrawn from the University.

GENERAL ACADEMIC REGULATIONS (COURSES, TIME ALLOTTED, COURSE LOAD, ETC.)

A programme of course shall be provided for the various disciplines leading to award of degree (to be denoted by appropriate three-letter subject code prefix for the programme), which may be awarded with Honours or Pass, based on a grade point average. Instruction is by courses, quantified into course units. Students will be required to take an approved combination of courses in the university, such as Senate, on the recommendation of the Department may determine from time to time.

Courses

Courses, which are modes of instruction in the university, shall be identified by a code of three letters designating the teaching and a three-digit number, the first digit of which indicates the level of the course. Thus:

Level (Year) 1 Courses designated as 100 series, numbered 111-199

Level (Year) 2 Courses designated as 200 series, numbered 211-299

Level (Year) 3 Courses designated as 300 series, numbered 311-399

Level (Year) 4 Courses designated as 400 series, numbered 411-499

Level (Year) 5 Courses designated as 500 series, numbered 511-599

Course Units

Evaluation of courses shall be in terms of units. One course unit is granted for a series of fifteen one-hour lectures or tutorials or a series of five three-hour laboratory practical classes or an equivalent combination of these type of instruction. A course shall not carry less than one or more than four course units except for full time programmes such as Industrial Training and Research Project. Fractional units are not allowed.

Course Categories

Courses shall be categorized as follows:

Pre-requisite

Courses, which knowledge is essential prior to taking another specified course. A pre-requisite course shall not be offered in the same academic year with the course to which it is pre-requisite.

Compulsory (C)

Courses, which must be registered for and passed by a student to obtain the degree in view and is counted towards his/her classification of the degree.

Required (R)

Any course designated as (R) by the Department must be taken but not necessarily passed. Where there is a group of such courses, the Department must state the minimum number of units to be passed.

Elective (E)

Courses designated as (E) are to be taken to make up the required additional units for the award of the degree.

Concurrent

Courses designated as concurrent are specified courses at the same level, which must be taken within the same semester

General Studies (GNS)

These are compulsory courses for all students in the University, irrespective of their programme, which must be registered for and passed.

Audited

An audited course is one, which the student attends but is not examined

Course abbreviations

AEE- Courses in Agricultural Economics and Extension

SOI- Courses in Soil Sciences

CRO-Courses in Crop Sciences

ANI- Courses in Animal Sciences

FOR- Courses in Forestry

FMA- Courses in Fisheries Management and Aquaculture

FMP- Courses in Farm Practices

Students' Industrial Work Experience Scheme (SIWES)

Students from 100 Level to 300 Level or 200 Level to 400 Level are required to participate and satisfactorily complete periods of approved industrial work experience for the award of a degree. This takes up between six (6) months or eleven (11) months depending on the discipline involved and is assigned academic credit units. Marks would be recorded for Industrial Training credit based on four criteria: (a) A logbook prepared according to specifications; (b) A final report prepared by the student on the experience; (c) An evaluation by the establishment where the student trained; (d) Periodic visits and evaluation by the University staff.

Course Examination

Each course must be completed and examined within the semester in which it is offered. The length of any examination shall be a period of one (1) hour and not more than three (3) hours. Students who pass will be credited with the assigned number of units.

Evaluation of Students' Performance

Evaluation of students' performance in a course shall be based on semester examinations and continuous assessment through assignments and/or periodic tests, which shall not constitute more than 30% weighting. Each course shall be graded on the basis of 100 total marks including the continuous assessment marks. The minimum pass mark for any course shall be 40%. Examination results in each course shall be recorded as percentage marks and shall be converted to letter grade points as follows:

MARK (%)	LETTER GRADE	GRADE POINT
70-100	A	5.0
60-69	B	4.0
50-59	C	3.0
45-49	D	2.0
40-44	E	1.0
BELOW 40	F	0.0

Cumulative Grade Point Average (CGPA)

The CGPA shall be obtained by

- i) multiplying the grade point assigned to the course by the number of units assigned to the course to arrive at the weighted score for each course;
- ii) adding together the weighted score for all courses taken up to that time;
- iii) dividing the weighted score by the total number of units.

CGPA must be calculated at the end of each semester.

Course Review and External Examiners' System

- i) 'Student Opinion Survey' and 'Peer Evaluation' will be conducted in all courses in the Department. This will contribute towards assessing the standard of teaching/instruction of the courses. The University will put in place a special unit to handle the conduct of such survey and the processing of survey results in a professional manner. The result of such evaluation is to be used in counselling the individual lecturer so as to improve on his or her teaching effectiveness.

- ii) External examiners shall be used only in the final year of the undergraduate programme to assess final year courses and projects, and to certify the overall performance of the graduating students.

Time allotted

To give guidelines on the use of the academic year and therefore semester, and for proper computation of contact hours for each course in a programme of study, the following are adopted:

- i. A two-semester year, (first (Harmattan) and second (Rain) semesters for regular courses).
- ii. The first and second semesters would last 18 weeks each while the remaining 12 to 14 weeks in a year will be devoted to the SIWES programme, which operate such system. The session is schedules as follows:

SEMESTER	REGISTRATION	LECTURES	EXAMINATION	TOTAL
1 ST SEMESTER	1 WEEK	15 WEEKS	2 WEEKS	18 WEEKS
SEMESTER BREAK				2 WEEKS
2 ND SEMESTER	1 WEEK	15 WEEKS	2 WEEKS	18 WEEKS
END OF SESSION BREAK				2 WEEKS
SIWES				12 WEEKS
TOTAL				52 WEEKS

Course load

Students

- i. A full time student shall normally be required to register for a minimum of thirty (30) credit units and a maximum of 48 credit units during each academic session except in the first when he/she is expected to register for 48 units. Any students wishing to register for less than the minimum or more than the maximum shall seek the permission of the College Board. However, Final year Non-Graduating (FNG) students shall be allowed to register for only the outstanding course units needed for graduation;
- ii. A programme of courses leading to a Bachelor degree shall incorporate, within its curriculum, a final year project, which shall, as much as possible, be geared towards developing the research capability of students;
- iii. Each course with the exception of research project will normally be completed in one semester and shall be examined at the end of that semester; and
- iv. A Bachelor degree programme will be completed in 10 semesters been a 5-year programme (those who join at 200 and 300 level by direct entry) will spend eight and six semesters less respectively.

Transfer students

A transfer student with advanced standing from another university will be required to spend not less than two academic sessions in the University to be eligible for a degree of Wesley University Ondo. The appropriate Department, College and the Senate will consider all transfer cases. Such candidates shall be assessed for the purpose of award of degree of the University, on a basis of courses actually taken in the relevant programme of the University. No transfer student shall be admitted in the first year of development.

Conditions to continue in a programme

- i. For a student to be in good academic standing and continue in the programme, he/she must obtain a minimum cumulative grade point average of 1.00 at the end of each session. A student who fails to do so will be placed on academic probation. If at the end of the probation year, his/her cumulative grade point average still falls below 1.00, such a student shall be advised to withdraw from the University;
- ii. Any students asked to withdraw from a programme shall be allowed to transfer to another programme provided he has the minimum requirements to be admitted into that programme. Student can only be allowed to transfer to another programme following poor performance;
- iii. A student who absents him/herself for two consecutive semesters without a valid reason may be asked to withdraw from the University, irrespective of his cumulative grade point average;
- iv. A student for good reasons and with the approval of Senate can suspend his programme of study for an approved period which shall normally not exceed one session.

Leave of absence

There is provision for leave of absence to take care of some minor problems that may arise in the course of every student's course of study. For example, if a student took ill, he/she could apply for leave of absence, i.e, a semester or one session as the case may be through his/her Head of Department to the Dean. The Dean in turn would take the application to the meeting of the College Board and consequently recommendations would be made to the Senate. The application should be supported by medical report from a recognized government hospital and should be duly certified by the Director of Medical Service. Students who have financial problems can also apply for leave of absence.

REQUIREMENTS FOR THE AWARD OF A DEGREE: UNDERGRADUATE PROGRAMMES

Minimum requirements for the award of an honours degree

To be awarded a degree with honours, a student shall pass a minimum of 120 credit units for a 4-year degree programme and 150 credit units for a 5-year degree programme, including all the compulsory courses stipulated by the Department for the programme in which the degree is to be awarded. Students are required to undertake the Students Industrial Work Experience Scheme (SIWES) for appropriate credit allocated by the Colleges. Where a student is unable to satisfy the minimum requirements for the award of honours degree requirements within two academic

sessions in excess of the minimum duration without Senate approval shall be required to withdraw from the University without the award of any degree.

Classification of Degree

Degree classification shall be based on the cumulative grade point average obtained by each student as follows:

CLASS OF DEGREE	CGPA
FIRST CLASS	4.50-5.00
2 ND CLASS UPPER	3.50-4.49
2 ND CLASS LOWER	2.40-3.49
THIRD CLASS	1.50 -2.39
PASS	1.0 - 1.49
FAIL	0 – 0.9

The CGPA is to be calculated to two decimal places.

Registration

(a) New Students

The procedure for the registration of new students is as follows:

- i. Obtaining the student pre-registration forms. Filling it and returning it to the Admission Officer with the required credentials;
- ii. Collecting the registration kit from the Admission Officer;
- iii. Presenting the originals of the required credentials to the Admission Officer who will sign the pre-registration forms and academic clearance after the credentials have been checked, verified and entry qualifications confirmed;
- iv. Proceeding to the College Officer who will issue course registration forms and direct students to the appropriate Heads of Departments for guidance in selecting course;
- v. After selection of courses, filling course registration forms separately and completely with biro and obtaining the signature of Courses and Level Advisers;
- vi. Submitting course registration forms to the College Officer for the signature of the Dean; and
- vii. Finally, asking the College Officer for copy of the course registration form.

Important: Note that registration is not complete until all payments are made and registration forms are submitted to appropriate places.

(b) Returning Students

- i. After due payments have been made, proceeding to the College Officer and obtaining course registration forms;
- ii. Consulting with the appropriate Heads of Departments for guidance in selecting courses;
- iii. After the selection of courses, obtaining the signature of Courses and Level Advisers;

- iv. Submitting course registration forms to the College Officer for the signature of the Dean;
and
- v. Finally, asking the College Officer for copy of the course registration form.

Residence

Residential accommodation is compulsory for all students.

DISCIPLINE

All students are expected to keep strictly to their Matriculation Oath sworn to on their formal admission into the University. They are, however, disciplinary measures are in place for erring students.

For offences that range from theft, alcoholism, bringing the name of the University into disrepute, insubordination, cultism, use of hard drugs, among others; there is a Student Disciplinary Committee that looks into them and recommends sanctions as appropriate to the Senate which ultimately pronounces appropriate disciplinary measures.

For examination offences, the offences are as follows:

1. **Impersonation:** If a student is discovered impersonating or helping another student to sit for an examination, both the impersonator and the impersonated student have committed an offence.
2. **Assault on invigilators/ examination attendant:** If a student physically attacks or assaults an invigilator, as well as involvement in any unruly behavior leading to the disruption of an examination, such a student has committed an offence.
3. **Coming to the examination hall with prepared answered sheet/script:** A student who comes to the examination hall with prepared answer scripts written on paper, on the body, clothing, etc. has committed an offence.
4. **Smuggling question papers out of examination halls:** A student caught smuggling question papers out before examinations commence or during examinations has committed an offence.
5. **Being found in examination hall with jotted notes:** Any student found with jotted notes, cribs or chips on body, under the locker or in the vicinity, writing relevant materials on palms and other places has committed an offence.
6. **Consulting with fellow students:** Any student caught consulting with fellow students or soliciting information or assistance, e.g. copying, exchange of answer sheets or question papers in the examination hall has committed an offence.
7. **Destruction of evidence related to examination misconduct:** Any student who destroys evidence related to an examination malpractice has committed an examination offence.
8. **Spying in the examination hall:** Any student caught spying the work of another student, or cheating on other student's paper has committed an offence.
9. **Failure to appear before examination misconduct committee:** A student who fails to appear before the duly constituted examination malpractice and irregularities committee is subject to disciplinary measure.

10. **Influencing invigilators/ examination officials:** If a student is found attempting to gain favour by influencing an invigilator or examination officials through oral, written or other means, the student involved has committed an offence.
11. **Consulting recommended books or lecture notes:** Any student caught consulting recommended books or lecture notes during examinations, except otherwise directed by the examiner has committed an offence.
12. **Unauthorized changing of sitting position:** If a student fails to consult the invigilator before changing his/ her sitting position, such a student has committed an offence.
13. **Refusal to complete examination misconduct forms:** Any student who refused to complete mal-practice form has committed an offence.
14. **Stealing question papers, marking scheme and other examination materials:** Stealing of question papers, marking scheme and other examination materials from a University official is a serious offence.
15. **Re-submission of used materials:** Any student who re-submits a test paper, an essay, a report or an assessment for another course after such had already been graded or is being graded has committed an offence.
16. **Coming late into the examination hall:** If a student comes thirty minutes late after the commencement of an examination, he/she has committed an offence.
17. **Aiding and abetting others:** Any student caught aiding and abetting others to copy from unauthorized material while examination is in progress has committed offence.
18. **Examination leakage:** Involvement in any form of activity that is related to examination leakage is an offence.
19. **Disobeying lawful examination instructions:** Any student found disobeying lawful examination instructions from examination officials while the examination is in progress e.g. failure to stop writing or writing before the examination starts has committed an offence.
20. **Plagiarism:** This is the act of presenting the ideas or words of another as one's own without acknowledging them, irrespective of the source. A student who does this has committed an offence.
21. **False medical certificate:** Submission of false medical or other certificates or obtaining such certificates under false pretense for examination purposes is an offence.
22. **Illegal candidates:** Sitting for an examination for which a candidate is not qualified, such as not meeting the percentage attendance at lectures/practicals etc. is an offence.
23. **Illegal exit from the examination venue:** Leaving the examination hall without the permission of the chief invigilator is an offence.
24. **Non-submission of scripts:** Failure by a candidate to submit his/her answer scripts after taking part in examination is an offence.
25. **Violation of safety regulation:** Any behavior in the laboratory or workshop etc. during examinations, in a manner violating safety regulations or constituting threat to the safety of others in the laboratory or workshop is an offence.
26. **Miscellaneous:** Other types of examination misconduct not specifically listed above but interpreted by the management to be an offence.

Candidates found guilty of any of the listed 26 acts of examination malpractices by the examination misconduct and irregularities committee (Disciplinary Committee) shall be penalized, ranging from suspension for varying periods, to expulsion, depending on the gravity of the examination malpractice.

Course Outline: Bachelor of Agriculture (Agricultural Economics and Extension)

100 LEVEL FIRST SEMESTER		HOURS		
CODE	COURSE TITLE	L	P	UNITS
BIO 111	GENERAL BIOLOGY I	3	0	3
BIO 113	GENERAL BIOLOGY LABORATORY I	0	3	1
CHM 111	GENERAL CHEMISTRY I	3	0	3
CHM 113	GENERAL CHEMISTRY LABORATORY I	0	3	1
CSC 111	INTRODUCTION TO COMPUTER	2	3	3
PHY 111	GENERAL PHYSIC I	3	0	3
PHY 113	GENERAL PHYSIC II	1	0	1
PHY 117	GENERAL PHYSIC LABORATORY I	0	3	1
MAT 111	ELEMENTARY MATHEMATICS II	3	0	3
LIB 111	INFORMATION RETRIEVAL	1	0	1
GNS 111	USE OF ENGLISH			
	TOTAL			19

100 LEVEL SECOND SEMESTER		HOURS		
CODE	COURSE TITLE	L	P	UNITS
BIO 122	GENERAL BIOLOGY II	3	0	3
BIO 124	GENERAL BIOLOGY LABORATORY II	0	3	1
CHM 122	GENERAL CHEMISTRY II	3	0	3
CHM 124	GENERAL CHEMISTRY LABORATORY II	0	3	1
CSC 122	COMPUTER PROGRAMMING CONCEPT	2	3	3
AGR 122	INTRODUCTION TO AGRICULTURE	3	0	3
MAT 122	ELEMENTARY MATHEMATICS II	3	0	3
GNS 122	USE OF ENGLISH	0	0	0
GNS 124	INTRODUCTION TO PHILOSOPHY AND LOGIC	0	0	0
	TOTAL			17

200 LEVEL FIRST SEMESTER		HOURS		
CODE	COURSE TITLE	L	P	UNITS
SOI 211	INTRODUCTION TO AGRO-CLIMATOLOGY	2	0	2
ANI 211	ANATOMY AND PHYSIOLOGY OF FARM ANIMAL	2	0	2
AEE 211	PRINCIPLE OF AGRICULTURAL ECONOMICS	2	0	2
CRO 213	INTRODUCTION TO BIOTECHNOLOGY	2	0	2
FOR 211	INTRODUCTION TO FORESTRY AND WILDLIFE MANAGEMENT	2	3	3
FST 211	INTRODUCTION TO FOOD SCIENCE AND TECHNOLOGY	2	0	3
FMA 211	INTRODUCTION TO FISHERIES	3	0	3
FMP 211	FARM PRACTICE I	0	3	3

GNS 211	INTRODUCTION TO ETHICS	0	0	0
GNS 213	NIGERIAN PEOPLE AND CULTURE	0	0	0
	TOTAL			20

200 LEVEL SECOND SEMESTER		HOURS		
CODE	COURSE TITLE	L	P	UNITS
SOI 222	PRINCIPLE OF SOIL SCIENCE	2	0	2
SOI 224	INTRODUCTION TO AGRICULTURAL ENGINEERING	2	0	2
SOI 226	AGRICULTURAL METROLOGY	2	0	2
AEE 222	INTRODUCTION TO AGRICULTURAL EXTENSION AND RURAL SOCIOLOGY	2	0	2
AEE 224	INTRODUCTION TO FARM MANAGEMENT AND PRODUCTION ECONOMICS	2	0	2
CRO 222	CROP ANATOMY, TAXONOMY AND PHYSIOLOGY	2	0	2
CRO 224	PRINCIPLE OF CROP PRODUCTION	2	3	3
ANI 222	PRINCIPLE OF ANIMAL PRODUCTION	2	0	3
ANI 224	INTRODUCTION TO AGRICULTURAL BIOCHEMISTRY	2	0	2
GNS 224	HISTORY AND PHILOSOPHY OF SCIENCE	0	0	0
	TOTAL			20

300 LEVEL FIRST SEMESTER		HOURS		
CODE	COURSE TITLE	L	P	UNITS
SOI 311	INTRODUCTION TO SOIL PEDOLOGY AND PHYSIC	2	0	2
AEE 315	APPLIED STATISTICS IN AGRICULTURE	3	0	3
CRO 311	ARABLE CROP PRODUCTION	2	0	2
CRO 313	CROP BREEDING AND GENETICS	2	0	2
ANI 311	NON-RUMINANT ANIMAL PRODUCTION	2	0	2
ANI 313	ANIMAL BREEDING AND GENETICS	2	0	2
FMP 311	FARM PRACTICE II	0	3	3
HEC 211	INTRODUCTION TO HOME ECONOMICS	2	0	2
FMA 315	PRINCIPLES OF AQUACULTURE	2	1	2
	TOTAL			20

300 LEVEL SECOND SEMESTER		HOURS		
CODE	COURSE TITLE	L	P	UNITS
SOI 322	INTRODUCTION TO SOIL CHEMISTRY AND MICROBIOLOGY	2	0	2
SOI 324	FARM POWER AND MACHINERY	2	0	2
CRO 322	PERMANENT CROP PRODUCTION	2	0	2
CRO 324	PRINCIPLE OF CROP PROTECTION	2	0	2
ANI 322	RUMINANT ANIMAL PRODUCTION	2	0	2
ANI 324	AGRICULTURAL BIOCHEMISTRY AD METHODS	2	0	2

AEE 322	EXTENSION TEACHING, LEARNING PROCESS AND METHODS	2	0	2
AEE 324	AGRIC-BUSINESS	2	0	2
FOR 322	LAND USE SYSTEM AND MANAGEMENT	2	0	2
ENT 321	ENTREPRENEURSHIP	0	0	3
	TOTAL			21

400 LEVEL FIRST SEMESTER		HOURS		
CODE	COURSE TITLE	L	P	UNITS
SOI 411	FARM MECHANIZATION	2	0	2
CRO 411	CROP PEST AND DISEASE CONTROL	2	0	2
ANI 411	ANIMAL HEALTH MANAGEMENT AND DISEASE CONTROL	2	0	2
AEE 411	AGRICULTURAL COMMUNICATION	2	0	2
AEE 413	REPORT WRITING AND PRESENTATION	2	0	2
AEE 415	APPLICATION OF COMPUTERS IN AGRICULTURE	1	1	2
FST 312	FUNDAMENTALS OF FOOD PROCESSING	2	0	2
FMP 411	FARM PRACTICE III	0	3	3
	TOTAL			17

400 Level Second Semester		
Course Code	Course Title	UNITS
AGR 422	SIWES	6
AGR 424	SIWES Seminar	2
AGR 426	SIWES Students' Report	4
AGR 428	SIWES Visitation Report	3
	TOTAL	15

500 LEVEL FIRST SEMESTER		HOURS		
CODE	COURSE TITLE	L	P	UNITS
AEE 511	STATISTICS AND RESEARCH METHODS	2	0	2
AEE 513	PRODUCTION ECONOMICS	2	0	2
AEE 515	ECONOMETRICS	2	0	2
AEE 517	DIFFUSION OF INNOVATIONS	2	0	2
AEE 519	PROGRAMME PLANNING AND EVALUATION IN EXTENSION	2	0	2
AEE 518	EXTENSION ORGANISATION AND ADMINISTRATION	2	0	2

AEE 512	AGRICULTURAL PROJECT APPRAISAL, MANAGEMENT AND SUPERVISION	2	0	2
AEE 514	AGRIC-BUSINESS MANAGEMENT AND FINANCE	2	0	2
AEE 516	FARM MANAGEMENT AND ACCOUNTING	2	0	2
AEE 510	INTRODUCTION TO MICRO-ECONOMICS	2	0	2
AEE 511	SEMINAR I	0	1	1
	ELECTIVES			
FMA 513	FISH FARMING ENGINEERING	2	1	2
CRO 511	VEGETABLE AND FRUIT CROP PRODUCTION	2	0	2
	TOTAL			23

500 LEVEL SECOND SEMESTER		HOURS		
CODE	COURSE TITLE	L	P	UNITS
AEE 522	AGRICULTURAL POLICY AND DEVELOPMENT	2	0	2
AEE 524	PRINCIPLE OF COOPERATIVE PRACTICE	2	0	2
AEE 526	RURAL COMMUNITY DEVELOPMENT	2	0	2
AEE 528	ADVANCED RURAL SOCIOLOGY	2	0	2
AEE 520	TECHNOLOGICAL AND SOCIAL CHANGE IN AGRICULTURE	2	0	2
AEE 522	PROJECT	4	0	4
AEE 521	SEMINAR II	0	1	1
AEE 521	ECONOMIC OF LIVESTOCK PRODUCTION AND MARKETING	2	0	2
AEE 528	GROUP DYNAMICS IN EXTENSION	2	0	2
AEE 525	PRINCIPLES OF MACRO-ECONOMICS	2	0	2
FOR 522	MULTIPLE LAND USE	2	0	2
	ELECTIVES			
CRO 520	POST- HARVEST PHYSIOLOGY AND PRODUCT STORAGE	2	0	2
ANI 526	ANIMAL PRODUCTION AND HANDLING	2	0	2
	TOTAL			25

(b) Bachelor of Agriculture (Animal Science)

Philosophy

The Bachelor of Agriculture degree in Animal Science is aimed to train high caliber personnel entrusted with knowledge of animal production as a tool for food security, income generation, gainful employment and the provision of high quality and wholesome animal products and services for the benefits of mankind.

Objectives

The programme is tailored to train undergraduates broadly in the field of agricultural production with emphasis on Animal Science.

Course Outline: Bachelor in Agriculture (Animal Science)

Same as that of Agricultural Economics and Extension from 100 to 400 Level

500 LEVEL FIRST SEMESTER		HOURS		
CODE	COURSE TITLE	L	P	UNITS
ANI 511	POULTRY, SWINE AND RABBIT PRODUCTION	2	0	2
ANI 513	CATTLE, SHEEP AND GOAT PRODUCTION	2	0	2
ANI 515	APPLIED ANIMAL BREEDING	2	0	2
ANI 517	REPRODUCTIVE PHYSIOLOGY AND ARTIFICIAL INSEMINATION	2	0	2
ANI 519	ANIMAL EXPERIMENTAL AND RESEARCH TECHNIQUES	2	0	2
ANI 512	NIGERIA FEEDS AND FEEDING STUFFS	2	0	2
ANI 514	PASTURE AND RANGE MANAGEMENT	2	0	2
AEE 514	AGRIC-BUSINESS MANAGEMENT AND FINANCE	2	0	2
FMA 513	FISH FARMING ENGINEERING	2	1	2
ANI 518	SEMINAR I	0	1	1
	ELECTIVES			
AEE 519	ADMINISTRATION AND PROGRAMME PLANNING IN EXTENSION	2	0	2
CRO 511	VEGETABLE AND FRUIT CROP PRODUCTION	2	0	2
	TOTAL			23

500 LEVEL SECOND SEMESTER		HOURS		
CODE	COURSE TITLE	L	P	UNITS
ANI 522	MONOGASTRIC NUTRITION	2	0	2
ANI 524	RUMINANT NUTRITION	2	0	2
ANI 526	ANIMAL PRODUCTION AND HANDLING	2	0	2
ANI 528	ANIMAL HEALTH AND DISEASES	2	0	2
ANI 520	GAME PRODUCTION AND UTILISATION	2	0	2
ANI 521	PROJECT	4	0	4
ANI 522	SEMINAR II	0	1	1
AEE 526	ECONOMIC OF LIVESTOCK PRODUCTION AND MARKETING	2	0	2
FOR 522	MULTIPLE LAND USE	2	0	2
	ELECTIVES			
AEE 524	PRINCIPLE OF COOPERATIVE PRACTICE	2	0	2
CRO 524	FORAGE AND FODDER CROP PRODUCTION	2	0	2
	TOTAL			21

b. B. Agric. Crop Production/Soil Management

Philosophy

The Bachelor of Agriculture degree in Crop production/Soil Management is aimed to train the required manpower in crop production using adaptable technologies in soil and crop management, crop improvement and protection for the benefits of mankind.

Objectives

The programme is tailored to train undergraduates broadly in the field of agricultural production with emphasis on Crop and Soil Science

Course Outline: Bachelor of Agriculture. (Crop production /Soil Management)

Same as that of Agricultural Economics and Extension from 100 to 400 Level

500 LEVEL FIRST SEMESTER		HOURS		
CODE	COURSE TITLE	L	P	UNITS
CRO 511	VEGETABLE AND FRUIT CROP PRODUCTION	2	0	2
CRO 513	CROP HUSBANDRY (FIELD CROP)	2	0	2
CRO 515	FIELD EXPERIMENTATION	2	0	2
CRO 517	PLANT PROTECTION	2	0	2
CRO 519	SOIL SURVEY AND LAND USE PLANNING	2	0	2
CRO 512	FLORICULTURE AND LANDSCAPE DESIGN	2	0	2
SOI 511	SOIL AND PLANT ANALYSIS	2	0	2
CRO 514	SEMINAR I	0	1	1
ELECTIVES				
AEE 514	AGRIC-BUSINESS MANAGEMENT AND FINANCE	2	0	2
SOI 513	SOIL AND WATER CONSERVATION	2	0	2
FMA 513	FISH FARMING ENGINEERING	2	1	2
TOTAL				17

500 LEVEL SECOND SEMESTER		HOURS		
CODE	COURSE TITLE	L	P	UNITS
CRO 522	CROP HUSBANDRY (PLANTATION CROPS)	2	0	2
CRO 524	FORAGE AND FODDER CROP PRODUCTION	2	0	2
CRO 526	PLANT BREEDING AND SEED PRODUCTION	2	0	2
CRO 528	WEED SCIENCE	2	0	2
CRO 520	POST-HARVEST PHYSIOLOGY AND PRODUCT STORAGE	2	0	2
CRO 521	PROJECT	4	0	4
SOI 522	SOIL FERTILITY AND PLANT NUTRITION	2	0	2
CRO 523	SEMINAR II	0	1	1
CRO 529	PRINCIPLE OF IRRIGATION	2	0	2
FOR 522	MULTIPLE LAND USE	2	0	2
ELECTIVES				
ANI 526	ANIMAL PRODUCTION AND HANDLING	2	0	2
AEE 528	GROUP DYNAMICS IN EXTENSION	2	0	2
TOTAL				23

c. B. Agric. Fisheries Management and Aquaculture

Philosophy

The Bachelor of Science Degree in Fisheries Management and Aquaculture is aimed to train the required manpower in science and technology of fisheries resources and biodiversity management for the benefits of mankind.

Objectives

The programme is tailored to train undergraduates broadly in the field of agricultural production with emphasis on Fisheries Management and Aquaculture.

Course outlines (Fisheries Management and Aquaculture)

Same as in Agricultural Economics and Extension in 200 Level

300 Level First Semester		HOURS		
Course Code	Course Title	L	P	UNIT S
HTM 211	Introduction to Hospitality Management and Tourism	2	0	2
FMA 311	Fish Biochemistry	2	0	2
FMA 313	Fish Biology	2	0	2
FMA 315	Principles of Aquaculture	2	0	2
FMA 317	Fisheries, Extension and Aquaculture	2	0	2
FMA 319	Limnology	2	0	2
FMA 312	Fish Farming Techniques and Hatchery Management	2	0	2
FMA 314	Fishing Gear Technology	2	0	2
FMA 316	Introduction to Oceanography	2	0	2
FMA 318	Fish Adaptation and Physiology	2	0	2
FMA 310	Fisheries Business Management and Marketing	2	0	2
	TOTAL			22
300 Level Second Semester		HOURS		
Course Code	Course Title	L	P	UNIT S
FMA 322	Fisheries Environmental Impact Assessment	2	0	2
FMA 324	Fisheries Biology	2	0	2
FMA 326	Fish Health Management	2	0	2
FMA 328	Ichthyology (Systematic of Fish)	2	0	2

FMA 320	Hydrobiology	2	0	2
FMA 323	Fish Nutrition	2	0	2
FMA 325	Elementary Seamanship and Navigation	2	0	2
FMA 327	Fish Pond Construction and Management	2	0	2
FMA 329	Introduction to fish Genetics and Breeding	2	0	2
FMA 321	Introduction to Fisheries Biometrics	2	0	2
ENT 322	Introduction to Entrepreneurial Skills	3	0	3
	TOTAL			23

	400 Level First Semester	HOURS		
Course Code	Course Title	L	P	UNIT S
FMA 421	Fishing Gear Production and Maintenance	2	0	2
FMA 423	Fisheries Recreational Planning and Interpretation	2	0	2
FMA 425	Oceanography Techniques	2	0	2
FMA 427	Aquaculture Engineering and Pond Management	2	0	2
FMA 429	Techniques in Fish Processing and Utilization	2	0	2
FMA 422	Analytical Techniques in Fisheries & Aquaculture	2	0	2
FMA 424	Aquaculture Production and Hatchery Management Technique	2	0	2
FMA 426	Fish Nutrition and Fish Food Techniques	2	0	2
	TOTAL			16

400 Level Second Semester Courses

Same as in Agricultural Economics and Extension Option

	500 Level First Semester	HOURS	
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Course Code	Course Title	L	P	UNIT S
FMA 511	Seminar	0	1	1
FMA 513	Ornamental Fisheries and Aquaria Design	3	0	3
FMA 515	Fish Population Dynamics and Stock Assessment	3	0	3
FMA 517	Fisheries Economics	2	0	2
FMA 519	Fish Processing Technology and Quality Assurance	2	0	2
FMA 512	Production of other Marine Products	2	0	2
FMA 514	Fish Farming Engineering	2	0	2
AEE 519	Programme Planning and Evaluation in Extension	2	0	2
	Electives			
CRO 511	Vegetables and Fruit Crops Production	2	0	2
ANI 513	Cattle, Sheep and Goat Production	2	0	2
	Total Number of Units			19

	500 Level Second Semester	HOURS		
Course Code	Course Title	L	P	UNIT S
FMA 522	Nigerian Feeds and Feeding Stuffs	2	0	2
FMA 524	Fish Production and Management	2	0	2
FMA 526	Advanced Fish Nutrition and Feed Technology	2	0	2
FMA 528	Fisheries Business, Product Development and Marketing	2	0	2
FMA 520	Water Quality Management and Pollution Control	2	0	2
FMA 523	Final Year Project	2	0	4

FMA 525	Fisheries Policy and Legislation	2	0	2
FOR 522	Multiple Land Use	2	0	2
	Electives			
AEE 528	Group Dynamics in Extension	2	0	2
SOI 526	Principles of Irrigation	2	0	2
	Total Number of Units			20

COURSE SYNOPSIS

100 LEVEL: SECOND SEMESTER

CRO 122: Introduction to General Agriculture (3 Credits)

The definition of agriculture. World population and food supply. History, scope and importance of agriculture to man. Agriculture and natural environment, Characteristic features of tropical agriculture and how they affect production. Land use and tenure. Trends in the production, distribution and utilization of agricultural products. Measures of improving Nigerian Agriculture. Climatic, edaphic and social factors in relation to crop production and distributions in Nigeria. Systems of crop farming. Types, distribution and significance of farm animals; basic principles of animal farming. Place of forestry, fish farming and wildlife in Agriculture.

200 LEVEL: FIRST SEMESTER

SOI 211: Introduction to Climatology (2 Credits)

The principles, aims and scope of climatology and biogeography. The elements and controls of climate and weather and the dynamics of the earth's atmosphere. Radiation and heating of the atmospheric systems, atmospheric moisture, the dynamics of pressure and wind systems. Condensation and precipitation processes. Seasonal variations in temperature, day length, radiation, rainfall and evapotranspiration. Equipment and maintenance of standard meteorological stations. The tropical climate; relation between agriculture and climate with reference to crops, livestock, irrigation, pests and diseases.

ANI 211: Anatomy and Physiology of Farm Animals (2 Credits)

Parts of the beef and dairy cattle, sheep, goats, pigs, rabbits and poultry. Fundamentals of cell biology. Anatomy and physiology of the cell, cell types. Anatomy and physiology of animal tissues, nervous system, skeletal system, muscle, bone, circulatory system, reproductive, digestive, special senses and other systems of farm animals. Physiological functions of animals – homeostatic, nutrition and digestion, respiration. Temperature regulation, excretion and reproduction. Endocrinology. The blood and circulation. Lactation, milk let down and egg production. Water balance.

AEE 211: Principles of Agricultural Economics (2 Credits)

The nature of economics and economic problems; scope and method; price theory and functions of the market with particular reference to agriculture. The concept of opportunity cost; Supply and demand and their application to agricultural problems. Production functions, cost analysis and functions. Concept of elasticities. Type of markets, perfect competition, monopoly, oligopoly etc. price theory and some applications. Theory of distribution; the components of agriculture in National income. Recourse allocation on farms. Aggregate income, expenditure, investment, interest rate, savings, employment. Inflation; international trade, commodity agreements, and balance of payments. Money and banking.

FOR 211: Introduction to Forestry and Wildlife Management (2 Credits)

General Introduction; Forest Biology and Silviculture; Silviculture and Silvicultural Activities; Forest Products/Produce and Utilization; Classification of Forest Produce ;Utilization of Forest Products; Wildlife Management; Principles of Wildlife Management; Fire as a Tool in Habitat Management; Assessment of Forest Resources; Mensuration; Taper and Form The Form of Trees; Principles of the Economics and Management of Renewable Natural Resources; Economic Aspects of Renewable Natural Resources; Management Aspect of Renewable Natural Resources

FMA 211: Introduction to Fisheries (3 Credits)

The important fishes and wildlife 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 and wildlife. Significance of fishes and wildlife in the diet of Nigerians. The fish and wildlife industries in Nigeria. Fundamental Principles of fish and wildlife management and production.

CRO 213: Introduction to Biotechnology (2 Credits)

Definition of biotechnology, history of early biotechnology applications, the techniques used in biotechnology, types of biotechnology, uses of biotechnology, recombinant DNA techniques, the spectrum of 'bioreactors' (organisms used for production), recent advances in the area of modern biotechnology, DNA, RNA and Protein Synthesis, Structure and function of DNA, types and functions of RNA's, methods of protein synthesis, genetic code, methods used in genetic engineered crops, constraint of access to genetic engineering technology in the developing world regulatory and ethical aspects of biotechnology.

FST 211: Introduction to Food Science and Technology (2 Credits)

Definition and Scope of food science and technology. Food distribution and marketing. Food and its functions. Food habits. Food poisoning and its prevention. Principles of food processing and preservation. Discussion of different preservation methods. Deterioration and spoilage of foods, other post-harvest changes in food. Contamination of foods from natural sources. Composition and structures of Nigerian/West African food; factors contributing to texture, colour, aroma and flavour of food. Cost; traditional and ethnic influence of food preparation and consumption pattern.

FMP 211: Farm Practice (3 Credits)

Practical farming on a portioned plot, the plot cleared and prepared by the student, crop planted and managed by the student, the proceeds marketed by the student. A field trip to reputable farm(s) organized in which the students are expected to present report.

GNS 211: Introduction to Ethics

GNS 213 Nigerian People and Culture

200 LEVEL: SECOND SEMESTER

CRO 222: Crop Anatomy, Taxonomy and Physiology (2 Credits)

Parts of the crop cell types. Introduction to plant taxonomy. Characteristics, distribution, economic importance and local examples of leguminosae, gramineae, compositae, Dioscoreacea, Rutaceae, Development of cells and tissues; use of plant keys. Cell biology, cell and cell types. Comparative anatomy of major plant organs. Enzymes. Photosynthesis and translocation; Pollination, respiration and energy utilization; seed dormancy and germination, development; mineral nutrition, growth regulation.

SOI 222: Principles of Soil Science (2 Credits)

Soils, their origin and formation. Physical properties of soils. Soil moisture, air and temperature, soil classification and survey. Soil colloids; soil reactions. Soil organic matter and soil organisms; soil and water conservation; Nutrient requirements and mineral nutrition of plants. Introduction to fertilizer (organic and Inorganic).

SOI 224: Introduction to Agricultural Engineering (2 Credits)

Definition of agricultural engineering; History of agricultural engineering (globally and nationally); Objectives of agricultural engineering; Requirements of an Agricultural engineer; Employment opportunities in Agricultural Engineering; Agricultural engineering regulatory bodies and professional societies; NIAE memberships grades; Areas of specialization in agricultural engineering; Farm power and machinery; Soil and water conservations engineering; Agricultural processing and storage; Farm structure and environment; Farm/Rural electrification.

SOI 226: Agricultural Metrology (2 Credits)

The principles, aims and scope of climatology and biogeography. The elements and controls of climate and weather and the dynamics of the earth's atmosphere. Radiation and heating of the atmospheric systems, atmospheric moisture, the dynamics of pressure and wind systems. Condensation and precipitation processes. Seasonal variations in temperature, day length, radiation, rainfall and evapotranspiration. Equipment and maintenance of standard meteorological stations. The tropical climate; relation between agriculture and climate with reference to crops, livestock, irrigation, pests and diseases.

ANI 222: Principles of Animal Production (2 Credits)

Animal Production and its development. The livestock industry – problems and prospects. Description of the breeds of cattle, sheep, goats, pigs, poultry and rabbits. Systems of livestock

production, Feeding habit of Farm animals. Principles of breeding and livestock judging. General principles of management of the different types of farm animals.

CRO 224: Principles of Crop Production (2 Credits)

Crop production and its development. The principles, problems and prospects of crop production. Importance of crop rotation, cultural practices; water and soil conservation; irrigation and drainage. General types and characteristics of arthropods, micro-organisms and other pests affecting crops. Weeds and their effects on crop production, pests, diseases and weed control. Basic Mendelian genetics. Principles of crop production, harvesting, processing and storage.

ANI 224: Introduction to Agricultural Biochemistry (2 Credits)

Basic Pathways Chemistry of carbohydrates, lipids, proteins and nucleic acids Vitamins and their coenzyme functions. Minerals. The nature, classification and function of enzymes and hormones Bioenergetics

AEE 222: Introduction to Agricultural Extension and Rural Sociology (2 Credits)

The need for agricultural extension. Agricultural extension in the world and in Nigeria, Basic philosophies behind agricultural extension work. The institutional setting of agricultural extension. Basic concepts and principles of rural sociology to an understanding of rural situation. Importance of rural communities and institutions, social stratification, social processes and social changes in rural areas. Leadership in rural communities; role and functions of rural leaders. Development of rural community leaders. The extension agent and the rural community. Communication techniques and strategies of change. Various agricultural extension teaching methods, aids and their use.

AEE 224: Introduction to Farm Management and Production Economics (2 Credits)

Theory of Production. Principles of agricultural production and resource use; factor-factor, factor-product and product-product relationship. Consumption and resource allocation in agriculture. Farm costs and revenue theories. Elements of time, risk and uncertainty in agricultural production. Types of farm records and their uses. Farm budgeting, gross and net margin analysis and farm planning.

GNS 224: History and Philosophy of Science

300 LEVEL: FIRST SEMESTER

ANI 311: Non-Ruminant Animal Production (2 Credits)

Management of breeding stock, growing and young animals. Housing, equipment and feeding principles of poultry, rabbits and pigs. Production and management practices; Livestock Economics; Health management of stock; processing and marketing of poultry, pigs and rabbits.

CRO 311: Arable Crop Production (2 Credits)

Origin, distribution, soil and climatic requirements of cereals, legumes, root crops, fibre crops, vegetables and other important arable crops in Nigeria. Improved varieties. Production practices, harvesting, utilization, processing, storage and economic aspects of some selected arable crops.

SOI 311: Introduction to Soil Pedology and Physics (2 Credits)

Soils, its origin and formation. Soil morphological characteristics, Soil components, soil forming rocks and minerals, weathering of rocks and minerals. Profile description, soil survey, soil mapping. Soil classification, properties and management of Nigerian soils. Classification of soil separates; solid texture, surface area of particles; aggregation soil structure and stability; porosity, soil water relations, soil and water the hydrological cycle, soil temperature and conduction, Soil erosion.

CRO 313: Crop Genetics and Breeding (2 Credits)

Cell structure and components, Chromosomes; structure, number and variations, linkage and crossing over, mutation and genes in population. Multiple alleles, Mitosis and meiosis. Theory of evolution. Fundamental principles of inheritance. Mendelism. Introduction to population and quantitative genetics. Objectives and general principles of crop breeding including their application to self-pollinated, cross pollinated and vegetatively propagated crops. General and special methods of selection in inbreeders and out-breeders; compatibility, male sterility. Heterosis. Polyploidy in crop breeding, Mutation breeding.

ANI 313: Animal Genetics and Breeding (2 Credits)

History of genetics; Chromosomes structure, number and variations. Gene and genotype. Genetic code, Mendelism; Fundamental principles of inheritance, quantitative and qualitative characters and their inheritance. Different types of gene actions, values and means, repeatability, heritability etc. Animal variation and selection principles. Breeding and environmental effects, in-breeding, pure line breeding, cross breeding and other breeding methods.

AEE 315: Applied Statistics for Agriculture (3 Credits)

Basic concepts of statistics. Frequency distribution, measures of location, measures of variation. Probability distribution, normal and binomial distribution. Histograms, means, mode and median, sampling, data collection, data processing techniques, statistical inference, tests of significance. F-Test, t-Tests, Chi-square, analysis of variance, analysis of co-variance; correlation and regression analysis. Goodness of fit. Research objectives, Research design, field experimentation, collection and processing of data.

HEC 211: Introduction to Home Economics (2 Credits)

Philosophy, Scope, objectives and historical development of Home Economics. Examination of basic human needs with respect to food, clothing, shelter and health, Programme approaches in Home Economics which will help meet these needs. Preparation for careers in a variety of occupations.

FMP 311: Farm Practice (3 Credits)

Practical farming on a portioned plot, the plot cleared and prepared by the student, crop planted and managed by the student, the proceed marketed by the student. A field trip to reputable farm(s) organized in which the students are expected to present report.

GNS 311: Entrepreneurship

300 LEVEL: SECOND SEMESTER

ANI 322: Ruminant Animal Production (2 Credits)

Management of breeding stock, growing and young animal, Housing, equipment and feeding principles of cattle, sheep and goats. Production and management practices. Health management of ruminant animals.

CRO 322: Permanent Crop Production (2 Credits)

Origin, distribution, soil and climatic requirements of some important permanent crops such as cocoa, oil palm, rubber, coffee, coconut, mango, sugar cane, bananas, plantains, citrus, kola, cashew, etc. Production practices, improvement, harvesting, utilization, processing, storage and economic aspects of some selected permanent perennial crops.

SOI 322: Introduction to Soil Chemistry and Microbiology (2 Credits)

Chemical composition of soils. Soil fertility conversion units and calculations; soil fertility evaluation, silicate mineral chemistry; cation and anion exchange phenomena and base saturation. Soil reaction (active and reserve acidity, alkalinity, buffering capacity). Soil acidity and liming. Survey of micro-organisms in soils and their role in soils. The dynamics of N, P and S pools. Association between microbes and plants.

AEE 322: Extension Teaching, Learning process and Methods (2 Credits)

Nature and elements of communication process. Principles of analyzing communication problems in extension. The meaning of the concepts of teaching, learning and motivation, Steps and principles of teaching and learning. Extension teaching methods. Preparation and use of teaching materials and aids.

SOI 324: Farm Power and Machinery (2 Credits) Aims and objectives of agricultural 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 drinkers for poultry, 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 costings and records. Workshop and building materials used on the farm.

CRO 324: Principles of Crop Protection (2 Credits)

The major pests, insect, fungi, bacteria, viruses and nematodes, weeds and other diseases of tropical crops and stored products. Definition of pests. Study of insect pests of major local crops, their significance and principles of control. Study of the effects of diseases caused by Virus, bacteria, fungi and nematodes. Control of these diseases. Effect of weeds on crops and livestock and the principles and methods of control of weeds. Brief outline, shortcomings and advantages of different pest assessment and pest control methods. Strategies of integrated pest control and pest management.

ANI 324: Agricultural Biochemistry and Methods (2 Credits)

Metabolism of carbohydrates, lipids, proteins and nucleic acid. Chemistry and mode of action of enzymes and hormones. Chemistry and analysis of selected agricultural products.

AEE 324: Agri-Business (2 Credits)

Secondary agricultural production, and/or agricultural processing in an agribusiness framework with respect to location, principles and procedures for efficient use of resources. Production scheduling, materials purchasing and handling; plant layout, methods of process analysis and job evaluation. Definition of basic concepts: agriculture sector, agribusiness sector, farm/firm and farming business, agricultural economics, food chain management systems. Forms of agribusiness. Resource requirements: land, labour, capital and entrepreneurship, organization of factors of production. Profit maximization criteria in farm business. Record keeping for a farm business. Planning aspects of agribusiness. Farm enterprise budgets. Importance of farm accounting system. Farm enterprise budgets. Importance of farm accounting system. Farm assets and valuation. Basic trading, profit and loss account, the balance sheet and ratio analysis.

FOR 322: Land Use System and Management (2 Credits)

General Introduction, What is Land, Land: Concepts, Definitions and Principles; Land use; land cover; Identifying Land Units; Some land qualities used to identify land units; Land use purpose(s) and Description; Rural land-use analysis; Operation sequence; Land use descriptions at various scales; Basics of Land evaluation; Land evaluation principles; Main conceptual steps in land-evaluation; Land Capability Classification Types (1)&(2); Land Use Planning; Pre-Requisites of Land-use Planning; Objective of Land Use Planning.; Land Use Planning Process; Socio-Economic Factors of Land Use Planning

400 LEVEL: FIRST SEMESTER

AEE 411: Agricultural Communication

Meaning of communication; The purpose of communication; Types of communication; Communication effects; Principles of communication relevant to agriculture; Elements of communication; Nature of the agricultural extension communication; Characteristics of extension messages; Barriers to effective communication; Requisites to achieving effective communication; Definition of theory and model of communication; Differences between theory and model of communication; Uses of theories and models in communication; Examples of theories and models of communication; Meaning of development; Communication in development; Development support communication; Importance of communication in agricultural/ rural development; Characteristics of selected media; Mass media communication; The radio; Print materials; Audio visual aids; Traditional/Folk Media (Oramedia); Campaigns; Audience analysis (Observation, Discussion, Surveys, Rapid Rural Appraisal); Operation, Care and Maintenance of selected Audio and Visual Equipment; Recording; Modern information and communication Appliances.

AEE 413: Report writing and presentation

The Importance and structure of an extension report, types or classes of extension report, concept of report writing, content of research report, prerequisites for good research reporting, report writing processes, analysis of case reports, news gathering techniques, mechanics and techniques of writing agricultural news stories for media. Improving agricultural extension report writing in Nigeria.

FMP 411: Farm Practice (3 Credits)

Practical farming on a portioned plot, the plot cleared and prepared by the student, crop planted and managed by the student, the proceeds marketed by the student. A field trip to reputable farm(s) organized in which the students are expected to present report.

CRO 411: Principles of Pest and Disease Control (2 Credits)

Principles of plant pathogenesis, dissemination of pathogen; air, water, insects, pollen and seed transplant. Identification of plant diseases; Koch's postulates, exception to Koch's postulate. Methods of plant disease control; principles of disease control, host plant resistance, biophysical resistance, biochemical resistance, avoidance of pathogen, exclusion of the pathogen, eradication of the pathogen. Disease control methods; chemical, physical, cultural, biological and mechanical methods.

SOI 411: Farm mechanization (2 Credits)

Definition of farm mechanization; History of farm mechanization; Aims of farm mechanization; Limitations of farm mechanization in Nigeria; Stages of the evolution of farm mechanization; Internal combustion engine; Agricultural tractor; Primary tillage operation; Secondary tillage operation; Planting operation; Crop development operations; Harvesting operations; Crop processing operations; Handling labour saving equipments on the farm; Farm transport; Selection of farm machinery; Economics of mechanization management.

FST 313: Fundamentals of Food Processing (3 Credits)

Basic methods of food processing and preservation; Principles and practice in thermal and low temperature preservation, dehydration/drying, concentration, irradiation and fermentation. Discussion should include equipment and systems. Preliminary and preparatory operations of raw materials; Selection, sorting, cleaning, grading and storage including discussion for on the industrial equipment. Principles of food plant sanitation.

ANI 411: Animal Health Management and Disease Control

The Economic impact of diseases on livestock; Environmental factors in relation to animal major livestock disease; Infection and immunity; Helminth and protozoan, parasites of livestock and poultry; Bacterial, fungal and viral infections of domestic livestock; Classification, diagnosis, epidemiology, prevention, treatment and control; Control of different livestock diseases; Notifiable diseases; Principles of immunity and disease resistance and their practical application; Animal handling and drug administration; Vaccination programme.

400 LEVEL: SECOND SEMESTER

Students will be on SIWES

500 LEVEL

AGRICULTURAL ECONOMICS AND EXTENSION OPTIONS

FIRST SEMESTER

AEE 511: Statistics and Research Methods (2 Credits)

Defining a research problem; developing hypothesis and objectives; principles of research design; questionnaire preparation and collection of data; measurement and data collection; statistical theory; different statistical methods for handling data; presentation of research findings in narrative, tabular and graphical forms.

AEE 513: Production Economics (2 Credits)

Theory and principles of agricultural production with respect to resources use, resource allocation, resource and product/enterprise combination; forms of production functions and their characteristics; response analysis; measurement of resource productivity. Introduction and definition of concepts: logic of economic theory, economic theory as abstraction, economic theory versus economic model, agricultural production economics, The assumptions of pure competition, why retain the purely competitive model. Theory and principles of agricultural production with respect to resource use, resource and product/enterprise combination. Forms of production functions and their characteristics.- production with one-variable input. Profit maximization with one variable input and one output. Response analysis- physical and economic relationships in agricultural production. The principles and measurement of resource productivity in traditional agriculture. Farm-firm cost functions. Production with two variable inputs. Maximization subject to budget constraints. Returns to Scale, Homogenous functions and Euler's theorem. Farm-firm resource allocation using linear programming techniques. Supply response analysis. Production of more than one product. Data collection for production function estimation.

AEE 515: Econometrics (2 Credits)

Econometric theory in production, simple regression, violation of basic assumption; estimation with bad or deficient data; multiple regression; statistical demand analysis; statistical production and cost analysis. Methods and application of econometrics to agricultural problems. Review of statistical concepts: random variables, properties of regression estimates, statistical tests of significance. Simple linear correlation analysis. Basic assumptions in econometrics. Functional forms and major problems of single-equation models. Special models including distributed lag models and dummy variable models. Simultaneous equation models with particular emphasis on identification and estimation methods.

AEE 517: Diffusion of Innovations (2 Credits)

Definition and elements of diffusion; processes of adoption and diffusion of innovation; the innovation decision process; characteristics of innovation; adoption rates and adopter categories; opinion leadership; change agents; theoretical formulations on the diffusion of innovation; sectors related to differential rates of adoption of new agricultural technology; implication of these processes and factors of effective agricultural extension in rural areas: 2 hours of lectures per week.

AEE 519: Programme Planning and Evaluation in Extension (2 Credits)

Concepts, theories, principles and guidelines of programme planning and evaluation in extension; Importance of programme planning in agricultural extension need, educative objective, learning experience, clientele participation, plan of work, and calendar of work; The

role of good public relations, good leadership and co-operation for an extension worker; Concept of evaluation applied to agricultural extension programmes. Case studies and practical problems of project evaluation in developing countries.

AEE 518: Extension Organization and Administration (2 Credits)

Concepts, theories, guidelines and principles of administration and organization of extension, Administrative functions, roles and responsibilities of various levels of extension and other relevant staff; staff recruitment, selection, placement and supervision; principles of morale and motivation; implications for extension staff development and promotion; creating conducive working environment; discipline; assessment of extension work accomplishments; improving Nigerian extension services.

AEE 512: Agricultural Project Appraisal, Management and Supervision (2 Credits)

Introduction to project appraisal. Theory, procedure and data requirements for appraisal and supervision of agricultural projects and programmes; project identification; tools of project analysis. The arithmetic of project appraisal cost-benefit analysis; rate of return calculations, cash flow procedures. Farm and other resource valuation. Case studies and practical problems of project appraisal in developing countries.

AEE 514: Agricultural Business Management and Finance (2 Credits)

The scope of agricultural business and management; types of agricultural business management and organizations; enterprise selection; production planning; public policies affecting agricultural business; farm growth; organization of large scale farms; legal organization and tax strategies; Economics of Agricultural Processing; marketing management; principles of agricultural finance; principles of farm credit; capital needs of agricultural industries; sources of loan, funds and collateral security for loans; credit agencies and government credit policy and approaches to efficient credit management; Farm accounting; inventory, balance sheet, cash book, cash book analysis

AEE 516: Farm Management and Finance (2 Credits)

The decision making process; depreciation techniques asset fixity; kinds and functions of farm records and accounts; basic principles of accounting; nature of simple farm accounts; farm planning and analysis; farm budgeting, farm records and inventory, the balance sheet, journal and ledger. Profit and loss statement preparation, adjusting entries. Problems of organizing and managing farms, linear programming. Forms of business organization and basic information on what could inform the choice. Different types of business organization and their characteristics- Sole proprietorship, partnership, Cooperative and Corporation. Definition of basic accounting concepts. Use of accounting information. Starting an accounting system- The accounting equation; A balance sheet; A journal; chart of account; A ledger. Analysing transactions. Financial management- Financial decisions evaluation of investment proposal, time value of money, sinking fund factor, discount factor, present worth of annuity, capital recovery factor; non-time adjusted approaches- payback period, average rate of returns; time adjusted approaches- Net present value, profitability index and internal rate of returns. Operational research- Transportation model

AEE 510: Introduction to Micro-economics (2 Credits)

Theory of consumer behaviour and demand- Indifference curves, Price and income effects on consumption; Income, substitution and price effects; Inferior and giffen goods; Theory of revealed preference

Characteristics of Market demand- Demand curves; Demand elasticity- income and price elasticity; Effects of price elasticity on revenue as output changes

The Neo-classical theory of firm- Production functions-one-input case; Two-input case; Product-product case; Cost functions: Short run and long run; Cost Minimization; Profit maximization; Social and Private costs; Economies and diseconomies of scale

Pricing and output of firms under different Market structures- Perfect competition; Monopoly/Monopsony; Monopolistic competition; Models of Oligopoly

An introduction to managerial and Behavioural theories of the firm; Theory of distribution-pricing and employment of resources in perfect and imperfect markets; Theory of general equilibrium and Welfare economics- General Equilibrium in production and exchange; Pareto optimality; External economies and diseconomies

Electives

CRO 511: Vegetable and Fruit Crop Production (2 Credits)

FMA 513: Fish Farming Engineering (2 Credits)

SECOND SEMESTER

AEE 522: Agricultural Policy and Development (2 Credits)

Historical and analytical treatment of government agricultural policies and programmes in Nigeria and developing countries in general; theories and policies of agricultural development; the role of agriculture in the economy; interrelationship between agricultural and individual development, sectoral planning of agriculture. Problems of agricultural development and planning. Integrated rural development planning.

AEE 524: Principles of Cooperative Practice (2 Credits)

The principles , scope and objectives of agricultural cooperation with respect to history, forms, management, operating policies and practices, legal and socio-political aspects, financial and other problems. History and development of Cooperatives. Classification and types of Cooperatives. Economics of Cooperatives. Nigerian Cooperative Organization. Mechanism of organizing a Cooperative Society. Cooperative Principles versus Modern Business Methods. Women Participation in Nigerian Agricultural Cooperatives

AEE 526: Rural Community Development (2 Credits)

Sociological economic and related policy perspective as they relate to rural development. The theories of community; community as a unit of social change; the micro and macro approaches to social change; dimensions of innovations; approaches to community development; community development and other developments. Model of rural/agricultural development and their relevance to Nigerian situation. Problems of institutions and infrastructural community. Case studies on community development in Nigeria and other developing countries. The future of communities in Nigeria.

AEE 523: Advanced Rural Sociology (2 Credits)

General Sociology theory, analysis of social structure of rural agrarian system and societies. Selected theories of social change and their potential for modernization of rural societies; social change and attitude change; measurement of change in rural societies; resistant and conducive forces to change in rural societies. Economic aspects of social change; group dynamics; traditional institution and their transformation, leadership patterns. Involvement of local people in directed change. Problems of rural societies, their causes and solutions. Special topics in rural sociology. Selected case studies.

AEE 520: Technological and Social Change in Agriculture (2 Credits)

Understanding technological change; basic sociological concepts, technological change and societies; general principles in introducing technological change; technological change in Nigerian agricultural development, agricultural extension; ethnical consideration in introducing technological change; agricultural engineers and public extension system.

AEE 522: Project (4 Credits)

Each student in the final year is expected to carry out a research project under supervision.

AEE 521: Seminar II (1 Credit)

Presentation and discussion of various topics in Agricultural Economics and Extension; the student is also expected to prepare and participate in all seminars and present a seminar in the final year.

AEE 521: Economics of Livestock Production and Marketing (2 Credits)

The place of livestock in the Nigerian Economy; Consumer and Consumption pattern of livestock product; Micro and Macro-economics in animal production; Agricultural production functions including data collection and analysis; Marketing theory in relation to livestock production; Application of economic theory and quantitative analysis. Capital investment and depreciation of capital; the economics of egg, meat and milk production. Livestock feed economics, input/return relationship in livestock production.

AEE 528: Group Dynamics in Extension (2 Credits)

What is group dynamics? The distinguishing characteristic of group dynamics; assumptions in group dynamics; importance of group dynamics in agricultural extension, the place of the individual in the group, motivation, blocks to participation in groups and adjustments to blocks and frustrations, group development, phases of group growth; internal dynamics of groups, external dynamics of groups, selection features and use of some group techniques; group evaluation; importance, feature and techniques; some studies in group dynamics, analysis of some groups relevant to agricultural extension

AEE 525: Principles of Macro-Economics (2 Credits)

Understanding macro-economic variables- GDP, production, income, nominal and real GDP, inflation rate, GDP deflator, Consumer Price Index, Inflation and unemployment. The Goods market- Changes in demand for goods/changes in production; Changes in production/changes in income; Changes in income/changes in demand for goods. The financial Markets- Level of

demand for money; Interest rate, money demand and Supply; Determinants of interest rate and role of central Bank; Money Supplier. The Goods and Financial Markets- Equilibrium in goods market and IS relation; Equilibrium in financial markets and LM relation; IS and LM relations put together (IS-LM model); IS-LM Models and short run economy. The labour market- Production and employment; Employment and wages; Wage increase, production costs and increase in price; Higher price and demand for wage increase; Putting all markets together (AS-AD Model); Derivation of aggregate demand and supply relations; Equilibrium output in the short run and medium term; Dynamic effects of monetary and fiscal policies. Inflation, Activity and Nominal Monetary Growth- Assessing the three relations between output, unemployment and inflation (Use of Okun's law, the Phillips curve and the aggregate demand relation; The medium run and changes in nominal money growth. Revision, presentation and Test.

Electives

CRO 510: Post Harvest Physiology and Product Storage (2 Credits)

ANI 526: Animal Products and Handling (2 Credits)

ANIMAL SCIENCE OPTION

FIRST SEMESTER

ANI 511: Poultry, Swine and Rabbit Production (2 Credits)

Building and equipment; incubation and hatchery management of poultry eggs; turkey, geese, duck and guinea fowl production. The application of the principles of feeding, housing, care, breeding and management as basis for successful production. Carcass cuts in swine and measures of carcass quality. Marketing. (1 hour of lecture and 2 hours of practical/week).

ANI 513: Cattle, Sheep and Goat Production (2 Credits)

The beef and dairy industry; Feeding and Management of Cattle, Sheep and Goats; Housing and equipment; Calf-rearing; growing and finishing operations; Milk production, handling and processing. Animal judging; herd recording, castration and dehorning. Production and lactation in Sheep and Goats; Marketing Milk, Beef, Goat and Sheep products. (1 hour of lecture and 3 hours of practicals/week).

ANI 515: Applied Animal Breeding (2 Credits)

Characters of economic importance in farm animals; statistical tools for studying inheritance; partitioning phenotypic variance and covariance; Estimation of genetic parameters (heritability, repeatability, genetic correlations); selection principles and methods; breeding (mating) systems; breeding plans for different farm animal species; foundation stock development.

ANI 517: Reproductive Physiology and Artificial Insemination (AI) (2 Credits)

The reproductive systems in male and female animals; Physiology of sperm and ovum; endocrinology; reproduction; Egg production; pregnancy and foetal development; fertility and sterility of farm animals. Role of AI in livestock production. Cloning, embryo transfer. Management of male donors; semen collection, evaluation, preservation and storage; artificial insemination techniques. (1 hour of lecture and 3 hours of practicals per week).

ANI 519: Animal Experimentation and Research Techniques (2 Credits)

Techniques and procedures in animal experimentation. Basic Statistical designs in animal science research problems.

ANI 512: Nigerian Foods and Feeding Stuffs (2Credits)

Classification of foods, feeding stuffs and feed supplements; Chemistry and nutritive values of succulent feeding stuffs, Concentrate feeds, cereals, legumes and oil seeds. Chemistry and nutritive values of some Nigerian grasses and legume species. Storage and quality control of feeding stuffs and feeds.

ANI 514: Pasture and Range Management (2 Credits)

Adaptation and botany of indigenous and introduced pastures and forage plants. Characteristics of grasses, legumes and shrubs. Establishment, production and seed production of pasture plants; the utilization and maintenance in permanent and temporary pastures. Range Management; Grazing Systems; Forage conservation, dry season feeds. (1 hour of lectures and 3 hours of practicals per week).

AEE 514: Agri-Business Management and Finance (2 Credits)

ANI 518: Seminar I (1 Credit)

Presentation and discussion of various topics in Animal Science; the student is also expected to prepare and participate in all seminars and present a seminar in the final year.

Electives

AEE 519: Administration and Programme Planning in Extension (2 Credits)

CRO 511: Vegetable and Fruit Crop Production

SECOND SEMESTER

ANI 522: Monogastric Nutrition (2 Credits)

Principles of monogastric nutrition, Elements of human nutrition; Dietary allowance, food surveys, food balance sheets; feeding standards; nutrient requirements for the various classes of animals, feed additives. Water in relation to nutrition. Water metabolic computation and ration formulation. Feed evaluation. Feed mixing and feed manufacture on large scale. The feed industry. (1 hour of lectures and 3 hours of practicals per week).

ANI 524: Ruminant Nutrition (2 Credits)

Microbiology of rumen; physiology of rumen action; Metabolic processes and pathways; Non-protein nitrogen utilization; Determination of digestion coefficients, balance trials; systems for energy evaluation, scheme for protein values; water in relation to nutrition and water metabolism; requirements and their inter-relationship in nutrition; Feed additives, proximate analysis; ration formulation, nutritional disorders. (1 hour of lecture and 3 hours of practicals per week).

ANI 526: Animal Products and Handling (2 Credits)

Preparation for slaughtering, evisceration and dressing percentages; care of carcass and its cuts; processing and care of hides, skin and wool; processing and storage of meat; milk processing and microbiology; and poultry products. Milk hygiene; Effect of cooking on meat and milk flavour. Post-harvest physiology of animal products; egg quality and grading chemistry and nutritive value of meat and eggs. Poultry products; milk by-products-butter, cheese and whey; preparation and storage of beef products – bacon, sausage and ham; food additives; flavours and aroma. Marketing and distribution of animal products. (1 hour of lectures and 3 hours of practicals per week).

ANI 528: Animal Health and Diseases (2 Credits)

The Economic impact of diseases on livestock; Environmental factors in relation to animal major livestock diseases. Infection and immunity. Helminth and protozoan parasites of livestock and poultry. Bacterial, fungal and viral infections of domestic livestock; the classification, diagnosis, epidemiology, prevention, treatment and control of different livestock diseases. Notifiable disease. Principles of immunity and disease resistance and their practical application; Animal handling and drug administration, vaccination programmes.

ANI 520: Game Production and Utilization (2 Credits)

Game production; harvesting strategies and problems of game cropping; “bush meat” processing methods, traditional uses of game and game products; hunting techniques; game ranching and domestication; growth behaviour and reproduction of animals in captivity; habit and food preferences. Design of paddocks, animal houses and cages. Husbandry techniques and health care in captivity.

AEE 526: Economics of Livestock Production and Marketing (2 Credits)

ANI 521: Project (4 Credits)

Each student is expected to choose and execute a special project under a Supervisor. Duration of the project is 2 Semesters.

ANI 523: Seminar II (2 Credit)

Presentation and discussion of various topics in Animal Science; the student is also expected to prepare and participate in all seminars and present a seminar in the final year.

FMA 523: Fish Farming Engineering (2 Credits)

Electives

AEE 524: Principles of Co-operative Practices (2 Credits)

CRO 524: Forage and Fodder Crop Production (2 Credits)

CROP/SOIL SCIENCE OPTION

FIRST SEMESTER

CRO 511: Vegetable and Fruit Crop Production (2 Credits)

History, definition, classification and importance of vegetable crops. Ecological distribution of vegetables and fruits in Nigeria. Varieties and adaptation of exotic vegetables and fruits to the Nigerian environment. Types 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 crops. Horticultural machines and equipment. Principles of producing, planting, maintaining ornamental trees, shrubs, perennials and fruits in the nursery, home and parks.

CRO 513: Crop Husbandry (Field Crops) (2 Credits)

Soil and climatic requirements; growth requirement; weed control and water use, improved varieties; production practices, diseases and pests harvesting, handling, processing, storage, marketing and utilization of field crops. Growth requirements of cereals, root, tubers, sugar crops, etc. Management and production of field crops. Fertilization; water use and weed control.

CRO 515: Field Experimentation (2 Credits)

Principles of field experimentation in crop and soil sciences. Research methodology; experimental layout, field survey; normal distribution and sampling; measurements and data analysis.

CRO 517: Crop Protection (2 Credits)

Quarantine regulations and phytosanitary measures. Fundamentals of plant resistance to diseases, principles and methods of disease control and management; principles, techniques and equipment for applying crop protection chemicals in the control of field and storage pest, diseases and weeds. Equipment maintenance and repair. Storage of pesticides.

CRO 519: Soil Survey and Land Use Planning (2 Credits)

Basic principles of soil classification; soil profile, study and description, soil survey methodology; assemblage of maps, photo; use of aerial photographs, topographic maps; field survey versus grid survey; field mapping; soil morphological investigations; laboratory determinations; soil correlation; soil survey report writing; interpretive reports; Management properties of some tropical soils, soil and land capability classification for various purposes. The use and misuse of land in the tropics. Land potential assessment.

CRO 512: Floriculture and Landscape Design (2 Credits)

Classification and identification of ornamentals, rationale of ornamentals, plants of the landscape, landscape design, planning, symbol and drawing. Residential landscape, institutions, parties and sports grounds. Field trips.

SOI 511: Soil and Plant Analysis (2 Credits)

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 elements and the interpretation of data; determination of pH; principles of instrumentation. Maintenance and operations of major analytical instruments; flame photometers, calorimeters, spectrophotometers; photometers, amino acid analyzers; IRV; UVR; pH meters; conductivity bridge; gas systems for monitoring analytical procedures; feature and functions of a soil testing laboratory.

CRO 514: Seminar I (1 Credit)

Presentation and discussion of various topics in Crop and Soil Science; the student is also expected to prepare and participate in all seminars and present a seminar in the final year.

Electives

AEE 514: Agri-Business Management and Finance

FMA 513: Fish Farming Engineering (2 Credits)

SOI 513: Soil Water Conservation (2 Credits)

Soil degradation: causes, chemical and physical. Soil fertility conservation: role of organic matter, crop residues, legume cover crops, agroforestry. Soil tillage: objectives, effects on soils and crop. Conservation tillage techniques; minimum tillage, Zero tillage. Soil erosion by water and wind: estimation and prediction. The universal soil loss equation. Extent of soil erosion problems in Nigeria, principles of control measures. Gully erosion control. Soil water conservation, rainfall conservation, evaporation control. Use of mulches.

SECOND SEMESTER

CRO 522: Crop Husbandry (Plantation Crops) (2 Credits)

Soil and climatic requirements; growth requirement; weed control and water use, improved varieties; production practices, diseases and pests harvesting, handling, processing, storage, marketing and utilization of field crops.

CRO 524: Forage and Fodder Crop Production (2 Credits)

Adaptation and botany of indigenous and introduced forage plants. Characteristics of topical grasses, legumes and shrubs. Establishment, production and seed production of forage plants; the utilization and maintenance in permanent and temporary pastures. Forage conservation, dry season feeds.

CRO 526: Plant Breeding and Seed Production (2 Credits)

Significance of reproductive system in cultivated plants; sexual and asexual reproduction. Techniques and principles of crop germ-plasm bank; role of plant breeding in pest and disease control in crops; selection methods in breeding programmes; maintenance of breeding stock; multiplication and distribution of improved crop varieties. Structure and nature of seed, functions of parts of seed, seed viability, vigour, dormancy and deterioration. Methods of breaking seed dormancy, production, processing, drying, treatment, packaging, storage and distribution of improved seed, seed certification. Procedures for field inspections; seed legislation and control. Seed testing procedures. Seed programmes in Nigeria. Seed Marketing.

CRO 528: Weed Science (2 Credits)

Characteristics, classification and biology of weeds. Losses due to weeds. Weed control methods and problems associated with them. Classification, chemistry, selectivity, formulation, application, storage and mode of action of herbicides. Herbicides and environmental interaction.

Safety factors in the use of herbicides; basis for herbicidal selectivity. Application equipment and techniques, practical methods of controlling weeds in Nigeria.

CRO 520: Post Harvest Physiology and Product Storage (2 Credits)

Storage life and harvested fruits, seeds, vegetables and flowers, tropical environment in relation to maturity, ripeness and senescence. Physical and chemical indices of quality in fruits, seeds, vegetables, flowers and other crop products. Storage of crop materials. Traditional methods of vegetable processing and storage. Fundamentals and principles of crop storage and transportation. Storage and shelf life problems; ideal atmosphere for storing fruits, seeds, vegetables, flowers and other crop products. Controlled environment for transit and long term storage; protective treatment, design and operation of equipment for storage and preservation.

SOI 522: Soil Fertility and Crop Nutrition (2 Credits)*

Fertility in tropical soils. Soil organic matter; its properties and maintenance, liming and its soil-plant relationships; nitrogen, potassium, phosphorus and sulphur contents of soil. The soil as a plant nutrient medium; fertilizers and fertilizer management – their manufacture, sources, applications, methods, rates and timing: handling and storage of fertilizers. Crop growth and response to soil nutrients; major, secondary and trace elements in crop nutrition; nutrient absorption, maintenance and loss in soil fertility in extensive and intensive agriculture. Role of legumes in soils.

CRO 521: Project (4 Credits)

Each student is expected to choose and execute a special project under the supervision of staff. Duration of the project is two semesters.

CRO 523: Seminar II (1 Credit)

Presentation and discussion of various topics in Crop and Soil Science; the student is also expected to prepare and participate in all seminars and present a seminar in the final year.

CRO 529: Principles of Irrigation (2 Credits)

Forms of irrigation; costs and profitability of irrigation; application of irrigation to different crops. Soil-water-plant-atmosphere relationship; assessment of water requirements for crops including meteorological approach and critical growth stages for water of different field crops; scheduling irrigation for the major crops; time of irrigation; agronomic management of irrigated crops; crop rotations and sequence under irrigated conditions, evaporation losses of irrigation water; maintenance of irrigation equipments. Agronomic practices of crops in problem soils; soil erosion and soil drainage under irrigation or under natural rainfall.

FOR 522: Multiple Land Use (2 Credits)

Land: It's Cover and Use(s), Land, Land cover and Land Use, Land cover and Land Use; Land Use and its Regulation; Land Use and Public Health; Types of land uses; Land Use and Land Use System: (LUS); Types of Land-Use Systems; Cropping Systems and Agro-ecosystems; Agricultural Production Systems; Dynamic Land Use System Analysis; Organic and High External Input Land Use Systems Analyses; Land use purpose(s) Operation Sequence; Land use descriptions at various scales. Farming System; Farm system, Livestock production systems; Goals of the holder; Land use classes; Land use classification; A-priori versus a-posteriori

classification; Land Use Types (LUT) Biophysical suitability assessment; Use of key attributes to define land use requirements; Use of key attributes to define factor ratings; Use of matching results to modify key attributes; Socio-economic assessment of Land Use Systems; Definitions of High Forest Land Use Types; Rural Land Use Rural Land Use Conflict; Human and Natural Influences on land use – the African Environment and socio-cultural premise; The Land tenure Premises; Recent Trends in Land Tenure; Pluralism and Conflict; Multi-purpose Use of land; Agroforestry; Efficiency, Adaptability and Compatibility in Multiple Land Use

Electives

ANI 526: Animal Production and Handling (2 Credits)

AEE 528: Group Dynamics in Extension (2 Credits)

FISHERIES MANAGEMENT AND AQUACULTURE OPTION

FMA 211: Introduction to fisheries

Introduction to biology of fishes and crustaceans with emphasis on tropical species. Diversity of fishes and crustaceans. Identification, nomenclature, morphology and evolution of some selected west African fish species.

300 LEVEL: FIRST SEMESTER

FMA 311: Fish Biochemistry (2 Credits)

Function, and biosynthesis of biological molecules, analysis of enzyme function and activity, bioenergetics, and regulation of metabolic pathways. Fish, their composition and food, water metabolism, chemistry and metabolism of carbohydrates, lipids protein, hormones, vitamins, minerals and antibiotics. Structure, energy transfer systems. General cell and molecular biology including membranes mitochondrial systems and intramembrane process. Bio-chemistry growth, maintenance and reproduction. Approaches for isolation and analysis of proteins and enzymes.

FMA 313: Fish Biology (2 Credits)

The gross external internal anatomy of a typical bony and a cartilaginous fish. Anatomy and Physiology of selected culturable fish species. The different types of anatomical system, functions of each system, organs in the fish Embryology and life history of a fish with special reference to commercially important fish e.g. tilapias, catfish and mullet. Fish endocrinology.

FMA 315: Principles of Aquaculture (2 Credits)

Aims and types of aquaculture. History and status of aquaculture in Nigeria. Concepts of stocking density and carrying capacity. Liming and pond fertilization. Water requirement. Stocking feeding and harvesting practices, food supply; growth rate and food conversion; Selection of culture species; Introduction to control of weeds, predators and diseases in

aquaculture production facilities. Introduction of exotic species and their implication. Effects of Aquaculture on the environment.

FMA 317: Fisheries and Aquaculture Extension(2 Credits)

Definition, philosophy and functions of fisheries and aquaculture extension. The context of extension of Fisheries and Aquaculture Department. Aquaculture extension services in national development. Extension and the aquaculture technology transfer systems: diffusion and management of innovations. Identification of target individuals/groups, opinion leaders and public sensitization. Problem identification and strategy formulation. Communication skills and preparation of visual aids. Launching of fisheries extension programmes.

FMA 319: Limnology (2 Credits)

Physical and chemical properties of both inland and sea water. Concept of Watershed and its hydrology. Hydrology and water Properties of inland waters; rivers wetlands, natural and manmade lakes. Thermal properties and stratification; fluxes of nutrients and materials to and within lakes; the paleial and littoral zones and their dynamics; sediments and palelimnology.

FMA 312: Fish Farming Techniques and Hatchery Management (2 Credits)

The different types of fish culture techniques, monoculture, polyculture, Intensive and extensive culture in open water bodies, in rice fields, floating cages, raceways, flow-through and closed systems. Introduction of fish farm wastewater management and reuse. Sources of fish seed and larvae (Wild and hatchery). The need of hatchery, Requirement for the establishment of a fish Hatcher, Types of Fish Hatchery, Hatchery Designs, Hatchery Operations and Management, Hatchery Equipment and Tools, Manpower Requirement in the Hatchery, Fish breeding methods, Selection and care of breeder. Preservation and storage of eggs and milt. Induction of ovulation, fertilization; incubation, feeding, management, harvesting and transportation of fry and fingerlings. Live fish production. Control of weeds, parasites and diseases in the hatchery.

FMA 314: Fishing Gear Technology (2 Credits)

Principles and evolution of fishing methods and gear. Description of various fishing gears. Basic principles of fishing gear design. Properties of the materials used in the construction of fish gears. Hanging coefficient. Assembling, seaming, mounting. Calculation of webbing requirements. Shaping by baiting, creasing and tailoring. Cutting ratio calculations. Construction of hooks and line traps and nets. Assessment of efficiency of fishing gear.

FMA 316: Introduction to Oceanography (2 Credits)

Marine environment. Ocean zonation, properties of sea water. Physical and chemical properties of Marine Environment. Salinity, chlorinity, currents, tides, wave, sound and radiation in the sea. Conductivity, diffusion, viscosity and dynamics of sea water Biological life and their distribution in the Ocean. Distribution and behavior of plankton. Brackish water conditions and fauna. Ocean productivity. Physiological adaptations of marine organisms.

FMA 318: Fish Adaptation and Physiology (2 Credits)

The different shapes and adaptive design in fish in relation to the aquatic environment. Natural environmental adaptation of fish to migration, reproduction, feeding habits, salinity, temperatures

and life cycles. Modified environment behavior of fish to pressure, light, electrical field and noise.

FMA 319: Fisheries Business Management and Marketing (2 Credits)

Investment opportunities in Fisheries and aquaculture. Principles of business management and marketing. Fisheries production and processing for efficient scheduling, purchasing, handling process analysis, plant layout and job assessment.

300 LEVEL: SECOND SEMESTER

FMA 322: Fisheries Environmental Impact Assessment (2 Credits)

Definition: Tropical aquatic environment. Developmental issues in aquatic environment. Conceptual framework for aquatic environmental management. Concept and history of Environmental impact Assessment, Nature and scope of environmental issues and impacts, Legal and administrative framework for EIA, purpose, principles and process Environmental impact Assessment, key elements of Environmental impact Assessment process, Concepts of integrated assessment. Costs and benefits of undertaking Environmental impact Assessment.

FMA 324: Fisheries Ecology (2 Credits)

Ecology of fishes with special reference to distribution and natural history. Application of this knowledge for fisheries management. Migratory behavior of Fishes. Ecosystem processes affecting their growth and survival. Plankton, and benthos, biomass assessment. Food and habitat selection, population and niche concept. Food chains. Reproductive behavior and life cycles of some selected species.

FMA 326: Fish Health Management(2 Credits)

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. International restriction binding the transportation of fish across county boundaries. Fish ponds and public health. Biosecurity and quarantine procedures.

FMA 328: Ichthyology (Systematic of Fish) (2 Credits)

Principles of systematic. Taxonomy and detailed study of principal commercial Fish species in Nigeria. Inland and marine fish invertebrates and reptile. Identification of species using keys and monographs. Important world species sardine; tuna, anchovy; etc. Biological attributes of fish populations. Phylogenetic relationships. Fish and biotic environment. Interactions between fishes and other organisms. Principles of fisheries models.

FMA 320: Hydrobiology (2 Credits)

Types of aquatic habitat. Study and identification of the characteristics of flora and fauna in the tropical fresh water and coastal swamps. The ecology, utilization and management of aquatic fauna and flora. Algal blooms and eutrophication.

FMA 323: Fish Nutrition (2 Credits)

Principles of fish nutrition. Concept of feeding Types of feeds (natural and artificial feeds). Digestion and absorption. Nutritional requirement of fish; proteins, carbohydrates. Lipids, vitamins and minerals Metabolism. Conversion rates, Nutrient deficiencies. Chemistry and Nutritive value of various classes of fish food. Introduction to fish feed formulation.

FMA 325: Elementary Seamanship and Navigation (2 Credits)

Important seas technology: parts of a boat, strength of wind and state of sea. Coast lights and light vessels. Equipments for measuring for distance, depth and speed. Launching and boarding of small boats. Safety at sea (lifesaving and firefighting equipments). Swimming.

FMA 327: Fish Pond Construction and Management (2 Credits)

Soil properties and investigation. Introduction to perimeter and elevation survey. Construction materials properties, tools and equipment; construction of different type of fish ponds (embankment, excavated). Introduction to concrete technology. Maintenance of ponds structures and impoundment. Management of earthen pond to enhance fish production.

FMA 329: Introduction to Fish Genetics and Breeding (2 Credits)

Definition and importance of Fish genetics. Genetic basis for selection. Analytical techniques and experimental approaches for the study and utilization of quantitative genetic variation in culture species. Statistical determination of genetic and phenotypic parameters for selected traits. Design and assessment of selection and breeding programmes. Genetic biotechnology employed in Fish, improvement, (diploid, polyploidy, tetraploid, induction). Use of quantitative data for assessing genetic change.

FMA 321: Introduction to Fisheries Biometrics (2 Credits)

An introduction to the most commonly used statistical techniques and applications in aquaculture and fisheries. Descriptive statistics, variables and distributions, populations and samples. Hypothesis testing models and tests of significance test. Sampling techniques and methods. Chi-square test. Randomization and replication. Steps in experimental design, analysis of variances. Blocking, Latin Squares, factorial, missing, values and Split plots. Correlation and regression analysis. The management of surveys and experiments and the presentation of results and conclusions.

400 LEVEL: FIRST SEMESTER

FMA 411: Fishing Gear Production and Maintenance (3 Credits)

Material for fishing net, steps in net making. Fishing net quality assessment. Assessment for design, construction and management of fisheries recreational system in Nigeria.

FMA 413: Fisheries Recreation Planning and Interpretation (3 Credits)

Identification and Culture ornamental fishes. Aquarium design and management. Planning, design construction and Management of fisheries recreational system in Nigeria.

FMA 415: Oceanography Techniques (3 Credits)

Instrumentation and measurement of physical, chemical and biological properties of ocean. Echo sounding, navigation and seamanship Safety measures.

FMA 417: Aquaculture Engineering and Pond Management (3 Credits)

Site survey, Fish Pond construction methods. Fish farm design and construction. Instrumentation in pond design and construction. Site mapping and topography survey. Design and layout of fish culture systems.

FMA 419: Techniques in Fish Processing and Utilization (3 Credits)

Methods of improving fish processing and utilization, fish transportation; techniques quality control and new product development. Standard in fish production safety (HACCP and ISO9000). Post-harvest plant production. Layout waste disposal and marketing of fish product.

FMA 412: Analytical Techniques in Fisheries and Aquaculture (3 Credits)

Water sample collection, preparation, preservation and analysis. Instrumentation in fish and water sample analysis. Instrumentation in fish and water sample analysis. Methods in pollution study (water and fish: acute and chronic test) Feed quality analysis.

FMA 414: Aquaculture Production and Hatchery Management Techniques (3 Credits)

Aquaculture production systems, hatchery infrastructure design management. Brood stock management and fish seed production.

FMA 416: Fish Nutrition and Fish Food Techniques(3 Credits)

Feed formulation and preparation of fish feed. Proximate composition of various local feedstuff Live fish food culture. Feed preservation, transportation and storage. Feeding regimes.

400 LEVEL: SECOND SEMESTER

Agricultural Industrial Attachment (SIWES) (12 Credits)

Report on the practical year activities and seminar presentation.

500 LEVEL: FIRST SEMESTER

FMA 513: Ornamental Fisheries and Aquatic Design (3 Credits)

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

FMA 515: Fish Population Dynamics and Stock Assessment (3 Credits)

Fishing effort and catch per unit effort. Population estimation, age and growth natality and morality. Computation of yields from given recruitment. Stock assessment.

FMA 517: Fishery Economics (2 Credits)

Application of population dynamics to fisheries economics. Major economic constraints in fishery development; free access fishery, sustainable yield curve and total revenue curve.

Binomic equilibrium, factor rents, welfare economic theory and its relevance for fisheries, externalities in fisheries, capital investment and depreciation of equipment consumer and consumption pattern; fishery resources and right of ownership. Economics/financial analysis of a fisheries project

FMA 519: Fish Processing Technology, and Quality Assurance (2 Credits)

Physical and chemical properties of Fish. Post mortem changes in fish- autolytic, microbial and entomological. Fundamentals of fish processing (to include fluid flow biotechnology and energy sources. Unit operation including extraction, freezing, cooling and drying. Fish preservation and processing methods- smoking, freezing, chilling, salting, pickling, fermentation and canning. Preparation of secondary fish products-paste, ensilage, caviar, protein concentrates, pate, oils, etc. Design and operation of system for processing plants for aquaculture products. Plant location, layout and waste disposal. Feed milling process, tools and equipment. Quality control of fish and their products; evaluation of freshness, quality, sanitation and hygiene. International Standards. HACCP and ISO 90001

FMA 512: Production of Other Marine Products (2 Credits)

Ecology, life histories of crustaceans and aquatic molluscs, culture of shrimps, oysters; crabs, crayfish, lobster cockles, periwinkles marine gastropods, frogs, edible sea weeds and fresh water plants. Deep sea and shore farming of some products. Processing and preservation of marine products.

FMA 514: Fish Farming Engineering (2 Credits)

General surveying, site election. Fresh water and brackish water pond construction. Design and construction of dykes, sluice 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 and mathematics in Aquaculture.

500 LEVEL: SECOND SEMESTER

FMA 522: Nigeria Feeds and Feeding Stuffs (2 Credits)

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

FMA 524: Fish Production and Management (2 Credits)

Practical aspects of handling and care of fish. Genetics and Breeding of fish. Production of fingerlings and fry; management of breeders; growers and other types of fish and marine products: buildings and equipment needed in a fish farm: Harvesting and marketing. Appraisal of management structure and effectiveness of fisheries management policies. Preparation of management plan for fisheries project.

FMA 526: Advanced Fish Nutrition and Feed Technology (2 Credits)

Advanced principles of fish nutrition. Requirements for energy, protein, vitamins and minerals, and non-nutrient components; feed computation and formulation methods; the fish feed industry; feed pelleting; fish feed habits; feed evaluation; practical considerations in fish feed. Manufacturing techniques for different types of feeds: dry, wet, semi-moist, frozen, extruded, pelleted and microencapsulated Feed formulation, feed mixing and manufacture of feed on commercial scale.

FMA 528: Fisheries Business, Product Development and Marketing (3 Credits)

Record keeping, cash flow analysis and aquaculture budgeting, financial statement value chain analysis, marketing access, analysis of fisheries project.

FMA 520: Water Quality Management and Pollution Control (2 Credits)

Physical composition of water bodies; Water quality parameters, standards and indices. Water chemistry and nutrient cycles; sampling methods management of selected marine, brackish and fresh waters. Chemical, mechanical and biological method for maintaining and improving water quality; biological ecological characteristics of polluted waters, effect of pollution on fish planktons, benthic macro invertebrates, algae and water Quality. Integrated management and control of Aquatic weeds.

FMA 523: Final Year Project (4 Credits)

Each student is required to choose and execute a special project under a supervisor. Duration of the project is two semesters.

FMA 525: Fisheries Policy and Legislation (2 Credits)

Objectives of fisheries administration and management, distribution of fisheries resources. Fisheries institutions and organization. Policies of governments in fisheries administration and development in Nigeria.

FOOD SCIENCE AND TECHNOLOGY PROGRAMME

1.0 INTRODUCTION AND GENERAL BACKGROUND

The programme started at the inception of the University and full academic activities commenced in 2009 with the admission of the programme pioneering students. The study of Food Science and Technology provides solid academic education and practical training for a great variety of career opportunities. Through positions in food industries, health care, non-governmental, international organizations, government services, private practice, the food and food service industries, and educational and community programmes, food scientist and technologist help individuals and the public to make better informed food choices. The mission of the Programme is to produce qualified food scientist and technologist capable of serving the country and the entire region in various aspects of food science and nutrition.

2.0 PHILOSOPHY

The Bachelor of Science degree programme in Food Science and Technology is aimed at adopting a multi-disciplinary approach in training students to give a broad base knowledge in all aspects of Food Science and Technology such that our graduates can choose to specialize in any of the relevant disciplines.

3.0 Objectives

The Department aims to train graduates that would produce adequate, safe, nutritious, wholesome and affordable processed foods to promote good health.

The objectives of the programme are to ensure students:

- i. Understand the interrelationships among agriculture, food processing, preservation, and storage.

- ii. Appreciate the effects of handling methods on the nutritive value of foods and apply the appropriate techniques to improve the quality of local food resources to meet the nutritional needs of individuals, community and population groups.
- iii. Have a global view of the problems of malnutrition and agencies involved in solving the problems, especially in Africa.
- iv. Know the concept underlying the correct choice and application of appropriate technology in reduction of post-harvest losses, processing, preservation and storage.

4.0 PROGRAMME OFFERED AND DURATION

The programme offered is Bachelor of Science Degree in Food Science and Technology. On duration of the programme, candidates who enter through Unified Tertiary Matriculation Examination (UTME) normally, will spend 5 years (Minimum), while the Direct Entry or Inter-University transfer candidates will spend 4 years (Minimum).

5.0 ADMISSION REQUIREMENTS

5.1 Minimum Entry Requirements into B.Sc Degree in Food Science and Technology

5.1.1 UTME Entry Requirements

Admission into 100 Level for Food Science and Technology course shall be through UME. The candidate must have a minimum of five credit pass at the SSCE level or its equivalent. The subjects must include English Language, Mathematics Physics, Chemistry, and Biology. Candidates seeking admission through the foundation programme or the pre-degree programme must also satisfy the WASC/SSCE minimum requirement.

UME subjects are Biology, Chemistry and any other Science subject.

5.1.2 Direct Entry /Transfer Requirements

Candidates with A' Level Certificate, National Diploma (ND) and Higher National Diploma (HND) certificates in relevant discipline from an approved institution with a minimum of not less

than an Upper Credit or its equivalent can be admitted through direct entry into 200L and 300L respectively.

At least 2 “A” level passes in Chemistry, Agricultural Science or Biology, Physics or Home Economics.

Upper Credit passes in NCE and OND in addition to 5 Credits at WASC/GCE O’L / SSCE (or its equivalent)

6.0 REQUIREMENTS FOR THE AWARD OF DEGREE

To qualify for the award of the Bachelor of Science (Honours) degree in Food Science and Technology;

- (a) The students must have completed a minimum of **195** credit units for five year programme 155 credit units for four year programme.
- (b) The students must satisfy both internal and external examiners in the written and practical projects, seminars and oral examination as may be prescribed from time to time by the Department.
- (c) All courses taught during each semester shall be examined at the end of that semester and candidates will be credited with the number of course unit assigned to the course, which they pass.
- (d) The total number of units taken along with the grades obtained in each course shall be recorded for the purpose of computing the Cumulative Grade Point Average (CGPA).
- (e) The weighted grade point of all courses taken shall be used for the determination of the class of degree.
- (f) The degree shall be awarded with honours provided a student obtains a Cumulative Grade Point Average (CGPA) that is not less than 1.5 and satisfies other minimum honours requirement.

- (g) Students are required to undertake the Students Industrial Work Experience Scheme (SIWES) for appropriate credit allocated by the Colleges.
- (h) Where a student is unable to satisfy the minimum requirements for the award of an honours degree after spending one extra session, he shall be considered for the award of a pass degree.
- (i) Students who cannot meet all the degree requirements within two academic sessions in excess of the minimum duration without Senate approval shall be required to withdraw from the University without the award of any degree.

Other Course Requirements

The minimum requirements for General Studies (GNS), Entrepreneurship (ENT), and Library Course (LIB) shall be 10 unit points.

7.0 Examination and Grading System

Each course must be completed and examined within the semester in which it is offered. The length of any examination shall be a period of one (1) hour and not more than three (3) hours. Students who pass will be credited with the assigned number of units

Evaluation of students’ performance in a course shall be based on semester examinations and continuous assessment through assignments and/or periodic tests, which shall not constitute more than 30% weighting. Each course shall be graded on the basis of 100 total marks including the continuous assessment marks. The minimum pass mark for any course shall be 40% (E).

Examination results in each course shall be recorded as percentage marks or letter grades and shall be converted to letter grade points as follows:

<u>Mark (%)</u>	<u>Letter Grade</u>	<u>Grade Point</u>
70 – 100	A	5.0
60 – 69	B	4.0

50 – 59	C	3.0
45 – 49	D	2.0
40 – 44	E	1.0
Below 40	F	0.0

The CGPA shall be obtained by

- i) multiplying the grade point assigned to the course by the number of units assigned to the course to arrive at the weighted score for each course.
- ii) adding together the weighted score for all courses taken up to that time.
- iii) dividing the weighted score by the total number of units.

The CGPA is calculated using the formula:

$$CGPA = \frac{\sum_{i=1}^L GPU_i}{\sum_{i=1}^L U_i}$$

L is the total number of courses taken (whether passed or failed) since entering the programme while GP_i is the grade point scored in course 'i' with unit U_i . CGPA must be calculated at the end of session.

8.0 Classification of Degree

The class of degree is determined by the CGPA at the end of the final year. The classification is as follows:

Class of Degree	CGPA
First Class (Honours)	4.50 - 5.0
Second class (Honours) Upper Division	4.00 - 4.49
Second class (Honours) Lower Division	3.00 - 3.49
Third class (Honours)	2.00 - 2.99
Pass	1.00 – 1.99
Fail	<1.0

9.0 Course Review and External Examiners' System

- i) 'Student Opinion Survey' and 'Peer Evaluation' are conducted in all courses in the University. This contributes towards assessing the standard of teaching / instruction of the courses. The university puts in place a special unit to handle the conduct of such survey and the processing of survey results in a professional manner. The result of such evaluation is used in counseling the individual lecturer so as to improve on his or her teaching effectiveness.
- ii) External Examiners is used only in the final year of the undergraduate programme to assess final year courses and projects, and to certify the overall performance of the graduating students, as well as the quality of facilities and teaching. However, major subject areas can be moderated externally in professional programmes. In the case of postgraduate programmes, all courses are externally moderated.

10.0 Timetabling

To give guidelines on the use of the academic year and therefore semester, and for proper computation of contact hours for each course in a programme of study, the following are adopted:

- i. A two-semester year (first and second semesters for regular courses)
- ii. The first and second semesters would last 18 weeks each while the remaining 12 to 14 weeks in a year will be devoted to the Students Industrial Work Experience Scheme (SIWES) for programmes, which operate such system. The session is scheduled as follows:

Semester	Registration	Lectures	Examination	Total
1 st Semester	1 Week	15 Weeks	2 Weeks	18 Weeks
Semester Break				2 Weeks
2 nd Semester	1 Week	15 Weeks	2 Weeks	18 Weeks
End of Session Break				2 Weeks

SIWES	12 Weeks
Total	52 Weeks

11.0 Course Load*

Students

- i. A full time student shall normally be required to register for a minimum of thirty (30) credit units and a maximum of 48 credit units during each academic session except in the first when he is expected to register for 48 units. Any student wishing to register for less than the minimum or more than the maximum shall seek the permission of the College Board. However, Final year Non-Graduating (FNG) students shall be allowed to register for only the outstanding course units needed for graduation.
- ii. A programme of courses leading to a Bachelors degree shall incorporate, within its curriculum, a final year project, which shall, as much as possible, be geared towards developing the research capability of students.
- iii. Each course with the exception of research project will normally be completed in one semester and shall be examined at the end of that semester.
- iv. A Bachelors degree programme will normally be completed in 8 semesters for a 4-year programme and 10 semesters for a 5-year programme (Those who join at 200 level by direct entry) will spend two semester less.

11.2 Staff Work Load

A full time staff is expected to carry a minimum of 8 course units per semester.

12.0 TRANSFER STUDENTS

A transfer student with advanced standing from another university will be required to spend not less than two academic sessions in the University to be eligible for a degree of Wesley University, Ondo. The appropriate Department, College and the Senate will consider all transfer cases. Such candidates shall be assessed for the purpose of award of

degree of the University, on a basis of courses actually taken in the relevant programme of the University. No transfer student shall be admitted in the first year of development.

13.0 CONDITIONS TO CONTINUE IN A PROGRAMME

- i. For a student to be in good academic standing and continue in the programme, he must obtain a minimum cumulative grade point average of 1.00 at the end of each session. A student who fails to do so will be placed on academic probation. If at the end of the probation year his cumulative grade point average still falls below 1.00, such a student shall be advised to withdraw from the University.
- ii. Any student asked to withdraw from a programme shall be allowed to transfer to another programme provided he has the minimum requirements to be admitted into that programme. Student can only be allowed to transfer to another programme following poor performance once.
- iii. A student who absents himself for two consecutive semesters without a valid reason may be asked to withdraw from the University, irrespective of his cumulative grade point average.
- iv. A student for good reasons and with the approval of Senate can suspend his programme of study for an approved period, which shall normally not exceed one session.

14.0 Leave of absence

There is provision for leave of absence to take care of some minor problems that may arise in the course of every student's course of study. For example, if a student took ill, he/she could apply for leave of absence, i.e., a semester or one session as the case may be through his/her Head of Department to the Dean. The Dean in turn would take the application to the meeting of the College Board and consequently recommendations would be made to the Senate. The application should be supported by medical report from a recognized government hospital and should be duly certified by the Director of Medical Service. Students who have financial problems can also apply for leave of absence.

15.0 Registration

(c) New Students

The procedure for the registration of new students is as follows:

- viii. Obtaining the student pre-registration forms. Filling it and returning it to the Admission Officer with the required credentials;
- ix. Collecting the registration kit from the Admission Officer;
- x. Presenting the originals of the required credentials to the Admission Officer who will sign the pre-registration forms and academic clearance after the credentials have been checked, verified and entry qualifications confirmed;
- xi. Proceeding to the College Officer who will issue course registration forms and direct students to the appropriate Heads of Departments for guidance in selecting course;
- xii. After selection of courses, filling course registration forms separately and completely with biro and obtaining the signature of Courses and Level Advisers;
- xiii. Submitting course registration forms to the College Officer for the signature of the Dean; and
- xiv. Finally, asking the College Officer for copy of the course registration form.

Important: Note that registration is not complete until all payments are made and registration forms are submitted to appropriate places.

(d) Returning Students

- vi. After due payments have been made, proceeding to the College Officer and obtaining course registration forms;
- vii. Consulting with the appropriate Heads of Departments for guidance in selecting courses;
- viii. After the selection of courses, obtaining the signature of Courses and Level Advisers;
- ix. Submitting course registration forms to the College Officer for the signature of the Dean; and
- x. Finally, asking the College Officer for copy of the course registration form.

Residence

Residential accommodation is compulsory for all students.

16.0 DISCIPLINE

All students are expected to keep strictly to their Matriculation Oath sworn to on their formal admission into the University. They are, however, disciplinary measures are in place for erring students.

For offences that range from theft, alcoholism, bringing the name of the University into disrepute, insubordination, cultism, use of hard drugs, among others; there is a Student Disciplinary Committee that looks into them and recommends sanctions as appropriate to the Senate which ultimately pronounces appropriate disciplinary measures.

For examination offences, the offences are as follows:

- 27. **Impersonation:** If a student is discovered impersonating or helping another student to sit for an examination, both the impersonator and the impersonated student have committed an offence.
- 28. **Assault on invigilators/ examination attendant:** If a student physically attacks or assaults an invigilator, as well as involvement in any unruly behavior leading to the disruption of an examination, such a student has committed an offence.

29. **Coming to the examination hall with prepared answered sheet/script:** A student who comes to the examination hall with prepared answer scripts written on paper, on the body, clothing, etc has committed an offence.
30. **Smuggling question papers out of examination halls:**A student caught smuggling question papers out before examinations commence or during examinations has committed an offence.
31. **Being found in examination hall with jotted notes:** Any student found with jotted notes, cribs or chips on body, under the locker or in the vicinity, writing relevant materials on palms and other places has committed an offence.
32. **Consulting with fellow students:** Any student caught consulting with fellow students or soliciting information or assistance, e.g. copying, exchange of answer sheets or question papers in the examination hall has committed an offence.
33. **Destruction of evidence related to examination misconduct:**Any student who destroys evidence related to an examination malpractice has committed an examination offence.
34. **Spying in the examination hall:** Any student caught spying the work of another student, or cheating on other student's paper has committed an offence.
35. **Failure to appear before examination misconduct committee:**A student who fails to appear before the duly constituted examination malpractice and irregularities committee is subject to disciplinary measure.
36. **Influencing invigilators/ examination officials:** If a student is found attempting to gain favour by influencing an invigilator or examination officials through oral, written or other means, the student involved has committed an offence.
37. **Consulting recommended books or lecture notes:** Any student caught consulting recommended books or lecture notes during examinations, except otherwise directed by the examiner has committed an offence.
38. **Unauthorized changing of sitting position:** If a student fails to consult the invigilator before changing his/ her sitting position, such a student has committed an offence.
39. **Refusal to complete examination misconduct forms:** Any student who refused to complete mal-practice form has committed an offence.
40. **Stealing question papers, marking scheme and other examination materials:**Stealing of question papers, marking scheme and other examination materials from a University official is a serious offence.
41. **Re-submission of used materials:** Any student who re-submits a test paper, an essay, a report or an assessment for another course after such had already been graded or is being graded has committed an offence.
42. **Coming late into the examination hall:** If a student comes thirty minutes late after the commencement of an examination, he/she has committed an offence.
43. **Aiding and abetting others:** Any student caught aiding and abetting others to copy from unauthorized material while examination is in progress has committed offence.
44. **Examination leakage:** Involvement in any form of activity that is related to examination leakage is an offence.
45. **Disobeying lawful examination instructions:** Any student found disobeying lawful examination instructions from examination officials while the examination is in progress e.g. failure to stop writing or writing before the examination starts has committed an offence.
46. **Plagiarism:** This is the act of presenting the ideas or words of another as one's own without acknowledging them, irrespective of the source. A student who does this has committed an offence.

- 47. False medical certificate:** Submission of false medical or other certificates or obtaining such certificates under false pretense for examination purposes is an offence.
- 48. Illegal candidates:** Sitting for an examination for which a candidate is not qualified, such as not meeting the percentage attendance at lectures/ practicals etc. is an offence.
- 49. Illegal exit from the examination venue:** Leaving the examination hall without the permission of the chief invigilator is an offence.
- 50. Non-submission of scripts:** Failure by a candidate to submit his/her answer scripts after taking part in examination is an offence.
- 51. Violation of safety regulation:** Any behavior in the laboratory or workshop etc. during examinations, in a manner violating safety regulations or constituting threat to the safety of others in the laboratory or workshop is an offence.
- 52. Miscellaneous:** Other types of examination misconduct not specifically listed above but interpreted by the management to be an offence.

Candidates found guilty of any of the listed 26 acts of examination malpractices by the examination misconduct and irregularities committee (Disciplinary Committee) shall be penalized, ranging from suspension for varying periods, to expulsion, depending on the gravity of the examination malpractice.

17.0 Course Outline B.Sc. Food Science and Technology

100 Level First Semester		CONTACT HOURS		
Code	Course Title	L	P	UNITS
BIO 111	General Biology	3	0	3
BIO 117	General Biology Lab. I	0	3	1
CHM 111	General Chemistry	3	0	3
CHM 113	General Chemistry Lab. I	0	3	1
CSC 111	Introduction to Computing	2	3	3
GNS 111	Use of English I	2	0	2
LIB 111	Information Retrieval	2	0	1
MAT 111	Elementary Mathematics	3	0	3
PHY 111	General Physics I	3	0	3
PHY 112	General Physics II	1	0	1
PHY113	General Physics Lab. I	0	3	1
	TOTAL UNITS			22

100 Level Second Semester		CONTACT HOURS		
Code	Course Title	L	P	UNITS
BIO 122	General Biology II	3	0	3
BIO 124	General Biology Lab. II	0	3	1
CHM 122	General Chemistry II	3	0	3
CHM 128	General Chemistry Lab. II	0	3	1
CSC 122	Computer Programming Concept	2	3	3
GNS 121	Use of English II	2	0	2
GNS 122	Introduction to Philosophy and Logic	2	0	2

MAT 122	Elementary Mathematics II	3	0	3
PHY 122	General Physics II	3	0	3
PHY 128	General Physics Lab. II	0	3	1
	TOTAL UNITS			22

200 Level First Semester		CONTACT HOURS		
Code	Course Title	L	P	UNITS
CHM 211	Physical Chemistry	2	0	2
GNS 212	Introduction to Ethics	2	0	2
MAT 212	Mathematical Methods I	2	0	2
GNS 112	History and Philosophy of Science	2	0	2
NUD 213	Fundamentals of Nutrition and Dietetics	3	0	3
MIC 211	Introductory Microbiology	2	0	2
FST 211	Introduction to Food Science and Technology	2	0	2
FST 212	Engineering Thermodynamics I	2	0	2
FST 213	Material Science	3	0	3
FST 215	Engineering Drawing	3	0	3
	TOTAL UNITS			23

200 Level Second Semester		CONTACT HOURS		
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Code	Course Title	L	P	UNITS
ANI 222	Principle of Animal Production	2	0	2
BUS 222	Production Management	2	0	2
CHM 242	Analytical Chemistry	2	0	2
CSC 224	Survey of Programming Languages	2	0	2
ELE 222	Electric Circuits	3	0	3
FST 22 1	Fluid Mechanics	2	0	2
MAT 234	Statistics for Life Science	2	0	2
FST 220	Engineering Thermodynamics II	2	0	2
FST 222	Workshop Practice	3	0	3
	TOTAL UNITS			20

	300 LEVEL FIRST SEMESTER	CONTACT HOURS		
Code	Course Title	L	P	UNITS
ENT 311	Introduction to Entrepreneurship	2	0	2
NUD 319	Applied Human Nutrition	3	0	3
FST 311	Food Biochemistry	3	0	3
FST 312	Fundamentals of Food Processing	2	0	2
FST 316	Fundamentals of Food Processing Lab.	0	1	1
FST 313	Food Engineering I	2	0	2
FST 317	Food Engineering I Lab.	0	1	1
FST 314	Food Microbiology I	2	0	2
FST 318	Food Microbiology I Lab.	0	1	1
FST 315	Technical Report Writing	2	0	2
	TOTAL UNITS			19

	300 LEVEL SECOND SEMESTER	CONTACT HOURS		
Code	Course Title	L	P	UNITS
FST 320	Food Chemistry	2	0	2
FST 327	Food Chemistry Lab	0	1	1
FST 321	Postharvest Physiology and Storage	3	0	3
FST 322	Food Engineering II	2	0	2
FST 328	Food Engineering II Lab.	0	1	1
FST 323	Food Microbiology II	2	0	2
FST 329	Food Microbiology II Lab.	0	1	1

FST 324	Food Analysis I	2	0	2
FST 340	Food Analysis I Lab.	0	1	1
FST 325	Unit Operations in Food Processing	2	2	2
FST 341	Unit Operations in Food Processing Lab.	0	1	1
FST 326	Food Machinery Maintenance	2	0	2
	TOTAL UNITS			20

400 LEVEL FIRST SEMESTER		CONTACT HOURS		
Code	Course Title	L	P	UNITS
ACC 211	Principle of Accounting	2	0	2
FST 411	Food Process Plant Design	3	0	3
FST 412	Cereal Processing Technology	3	0	3
FST 413	Pilot Work in Food Processing	2	0	2
FST 417	Pilot Work in Food Processing Lab.	0	1	1

FST 414	Food Analysis II	2	0	2
FST 418	Food Analysis II Lab.	0	1	1
FST 415	Food Biotechnology	2	0	2
FST 416	Food Dehydration Technology	2	0	2
	TOTAL UNITS			18

		400 LEVEL SECOND SEMESTER		CONTACT HOURS	
Code	Course Title	L	P	UNITS	
FST 421	Industry-based Supervisor's Assessment	6	0	6	
FST 422	University Supervisor's Assessment	3	0	3	
FST 423	SIWES Seminar Presentation	2	0	2	
FST 424	Student's Report	4	0	4	
	TOTAL UNITS			15	

		500 LEVEL FIRST SEMESTER		CONTACT HOURS	
Code	Course Title	L	P	UNITS	
FST 512	Food Product Development	3	0	3	
FST 513	Fish and Meat Technology	2	0	2	
FST 531	Fish and Meat Technology Lab.	0	1	1	
FST 514	Food Standards, Laws and Quality Control I	3	0	3	
FST 515	Food Equipment Design	2	0	2	
FST 532	Food Equipment Design Lab.	0	1	1	

FST 518	Research Project I.	3	0	3
FST 511	Seminar			2
*Electives (2)				4
	TOTAL UNITS			21

* FST 516 – Thermobacteriology 2 Units

FST 517 – Nutrition in Health and Diseases 2 Units

FST 518 – Fermented Foods and Beverages 2 Units

FST 519 – Advanced Food Analysis 2 Units

	500 LEVEL SECOND SEMESTER	CONTACT HOURS		
Code	Course Title	L	P	UNITS
FST 520	Food Storage and Packaging Technology	3	0	3
FST 521	Dairy Processing Technology	2	0	2
FST 528	Dairy Processing Technology and Lab.	0	1	1
FST 522	Food Standards, Laws and Quality Control II	3	0	3
FST 523	Postharvest Technology	3	0	3
FST 510	Research Project II	3	0	3
BFN 224	Element of Banking	2	0	2
*Elective (1)				2
	TOTAL UNITS			19

* FST 524 - International Food Policy	2 Units
FST 525 – Toxic Constituents of Food	2 Units
FST 526 – Selected Topics in Food Technology	2 Units
FST 527 – Elements of Food Processing and Preservation	2 Units

Course Synopsis

FST 211 Introduction to Food Science and Technology

2 Units

Scope and roles of Food Science and Technology. Review of global food situation with emphasis on Nigeria; local and exotic food commodities of plant and animal origin. Introduction to the micro-flora of foods. Physical, chemical and biological principles of food processing and preservation. Food groups/classification. Food spoilage factors. Indigenous food processing methods. Food additives. Introduction to the concept of engineering units and dimensions applicable to the food industry, stoichiometry, chemical equations and flow charts. 30h (T)

FST 212 Engineering Thermodynamics I

2 Units

Basic concepts, deformations and laws. The ideal gas, Heat and Work, perpetual motion machines. Reversible and Irreversible processes and cycles; entropy; thermodynamics properties of ideal and fluids, introduction to power refrigeration cycles. The first law of thermodynamics, applications to open and closed systems. The steady state flow equation (Bernoulli's Equation) and applications. Second law of thermodynamics and Heat Cycles. 30h (T)

FST 220 Engineering Thermodynamics II

2 Units

The second law of thermodynamics and its corollaries; reversibility and irreversibility; the thermodynamic temperature scale entropy and its characteristics; pure substances; state changes in a system consisting a pure fluid substance. Introduction to heat engines and heat pumps;

refrigeration, gas liquefaction; phase equilibria, chemical for homogenous and heterogenous system. 30h (T)

FST 221 Fluid Mechanics

2 Units

Elements and basic equation of fluid statics: density, pressure, surface tension, viscosity, compressibility, etc. hydrostatic forces on submerged surfaces due to compressible fluid. Introduction to fluid dynamics – conservation laws. Introduction to viscous flow. Fluids characteristics. Application of fluid mechanics. Boundary layer flow systems. Basic concepts of heat transfer. Heat exchange and design. Mass transfer, mass transfer coefficients. Concepts of diffusivity, momentum and mass transfer. Application of the theory of the theory of heat, mass, momentum transfer in the food industry. 30h (T)

FST 222 Workshop Practice

3 Units

Workshop setting: types of workshop equipment, machines and materials, instruments and tools. Wood work- Wood work equipment. Wood joinery. Metal work equipment. Metal joinery. Safety procedures in workshops

FST 213 Material Science

3 Units

General consideration of materials of construction for food machinery. Design features and functions of equipment used in cleaning, sorting, grading, size reduction, mixing, emulsification, filtration and centrifugation, crystallization, concentration and other units operations of the food industry. Atomic and molecular structure, crystals. Metallic states. Defects in crystals, conductors, semi-conductors and insulators. Alloy theory – Application to industrial alloys – steel in particular. Engineering properties – their control. Hot and cold working, heat treatment, etc. Creep, fatigue and fracture. Corrosion and corrosion control. Non-metallic materials – glass, rubber, concrete, plastics, wood and ceramics. Elastic and plastic deformations. Defects in metals. Force equilibrium – free body diagrams. Concept of stress, strain: Tensile test. Young's moduli and other strength factors. Axially loaded bars, composite bars, temperature stresses and simple in determinate problems. Hoop stress; cylinder-rings. Bending moment, shear force and axial force diagrams for simple cases. Simple torsion and application. 30h (T)

FST 215 Engineering Drawing**3 Units**

Types of lines, plane geometry, tangency construction; bisection and division of lines, construction of angles, construction of regular polygons, construction of ellipse, construction of hyperbola and parabola, Dimensions and tolerancing, Isometric and orthographic projection, construction of an involute. Projection of models in technical drawing; free-hand sketching and instrumental drawing. Representation of mechanical fastener in drawing; bolts, nuts, studs, caps, screws, rivets, etc; internally threaded holes. Sectioning practices; necessity for sectioning; cutting planes and cutting planes lines, full and half sections; hatching; rules relating to sectioning; examples of sectioning in machine drawing. More on orthographic projections for standard machine parts; isometric projections; points, lines and objects in space; true shapes and dimensions; auxiliary views; elementary intersection curves and development; assembly drawings, Cam profiles; symbols and abbreviations used in engineering. 30h (T)

FST 311: Food Biochemistry**3 Units**

Introduction: hydrogen ion concentration and buffers. Properties of water, solvent nature, dissociation, ionic products, Henderson Hasselbach equation, Importance of buffers in biochemical systems. Food macromolecules. Primary metabolic pathways. Biochemical energetic, Basic enzymology. 30h (T)

FST 321: Food Chemistry**2 Units**

Food constituents and composition. Nature and properties of water, carbohydrates, proteins, lipids, vitamins, minerals, pigments, food additives, flavour compounds, etc. Chemical, physical and biological changes of food constituents during harvesting, storage, processing and preservation. Oxidation and interaction of food constituents including enzymic and non-enzymic browning. Solutions and intermolecular forces. Food emulsions. Chemistry of food groups,

cereals and legumes, baking chemistry, brewery technology etc, roots and tubers, fish and meat. Anti-nutritional factors in food. 30h (T)

FST 312: Fundamentals of Food Processing

2 Units

Basic methods of food processing and preservation. Principles and practice in thermal and low temperature preservation, dehydration/drying, concentration, irradiation and fermentation. Discussion should include equipment and systems. Preliminary and preparatory operations of raw materials: selection, sorting, cleaning, grading and storage including discussion for the industrial equipment. Principles of food plant sanitation. 45h (T)

FST 321: Post Harvest Physiology & Storage

3 Units

Post-harvest physiology of horticultural commodities including ripening and senescence. Regulation of ripening and senescence (respiration and ethylene phenomena). Handling and physiological disorders and diseases of horticultural commodities. Response of plant food commodities to stress conditions and injury. Control of post-harvest losses. Handling and storage of cereal grains and legumes. Measurement and control of temperature, relative humidity, moisture of stored foods. Study of food structures. Principle and practice of storage. 30h (T), 45h (P).

FST 313: Food Engineering I

2 Units

Dimensional analysis. Flow properties of food materials. Mechanical operations. Extrusion. Basic design features of food handling equipment. Physical and Engineering properties of food materials. Strength of food materials. The use of young modulus, the shear modulus and poisson's ratio in the evaluation of food strength. 45h (T)

FST 32: Food Engineering II

2 Units

General principles and mode of heat transfer. Pasteurization and sterilization. Dehydration and Evaporation. Principles of mass transfer. Contact equilibrium separation process. Design features, fabrication and readily available construction materials. Functions of equipments used in the food industry for preparation and unit operation. Electric motors and pumps used in food industries. 30h (T)

FST 314: Food Microbiology 1

2 Units

Historical aspects and scope of microbiology with emphasis on the place of microorganisms in the world. Types of microorganisms – bacteria, viruses, fungi, rickettsiae, chlamydia, protozoa, algae, etc. Growth and reproduction of microorganisms. General characteristics of microorganisms. Sterilization and disinfection. Structure, ecology and reproduction of representative genera. Cultivation of microorganisms. Isolation of bacteria, fungi, viruses, etc. Nutrition and biochemical activities of microorganisms. Antigens and antibodies. Economic importance of selected microbial groups. Microbial variation and heredity. Micro-organisms classification and functions. Study of micro-organisms associated with spoilage of fruits, vegetables, sea-foods, meat and meat products, nuts, spices, frozen foods, canned and fermented foods. 30h(T)

FST 323: Food Microbiology II

2 Units

Microbial aspect of food processing and preservation. Public health aspects of food microbiology including food poisoning (bacteria, protozoan, viral and helminths). Control and investigation of food borne diseases. Microbial indicators. Laboratory methods of assessing microbiological status of different classes of food commodities. Sanitation. Indicator Organisms: Coliforms, Faecal Coliforms, E. Coli. Enterobacteriaceae, other indicators. Food spoilage: microbial functions, food composition, degradation of components, spoilage of fruits, vegetables, animal products, dairy products, canned foods. Controlled degradation by useful microorganism. 30h (T),

FST 315: Technical Reporting Writing**3 Units**

Basic features of research proposals, projects write up, feasibility studies, seminar presentation. Criteria for the assessment of research proposals and projects write up and seminars e.g presentation (Computer-aided seminar presentation), abstract, introduction, methodology, results and references. Sociological surveys. 45h (T)

FST 324: Food Analysis I**2 Units**

Sampling techniques. Proximate analysis (moisture, fibre, protein, ether extract, ash, carbohydrate) of foods. Analysis of micro-constituents in food (minerals, vitamins, colours, additives and contaminants). The principles and application of analytical methods such as photometry, colourmetry, gravimetry, refractometry. General principles of chromatographic techniques (column, paper, thin-layer, gel, gas-liquid, gas-solid, high performance liquid chromatography). Analysis of edible oils, properties and composition of ash. Wet digestion of foodstuffs, and determination of minerals, chloride and phosphorus. Determination of vitamins, sugars and starches and preservatives. 30h (T) 45 (P)

FST 340 Food Analysis I Lab**1 Unit**

Structure of starches, sugar rotation. Determination of melting point, flame point of oil and fats. Determination of benzoic acid in beverages. Phenolase, peroxidase and catalase tests. Phosphates test/ determination. Hydrogen cyanide determination. Non-protein nitrogen determination.

FST 316 Fundamental of Food Processing Lab**1 Unit**

Tutorials and experimentations in food processing methods such as dehydration, concentration, canning, smoking, irradiation, fermentation, salting, pickling etc.

Particle size distribution using Tyler sieves, Determination of fineness modulus and uniformity index. Comparison of particle size distribution on the materials obtained from burr mill, hammer and roller mill.

FST 317 Food Engineering I Lab.

1 Unit

Particle size reduction using various mills such as kenwood blender, attrition or electric motor milling machine and mortar and pestle. Determination of particle size using various methods. Drying of food materials using oven to determine their wet bulb temperature, equilibrium moisture content (EMC) and their falling rate.

FST 329 Food Engineering II Lab

1 Unit

Extraction with particular reference to oil extraction from groundnut and palm kernel using electric motor oil expeller and determining their efficiency rate. Distillation processing techniques using distillation method to separate two miscible liquids. Evaporation procedure as a process of concentrating liquid food substances using evaporating device and determine the level of concentration. Demonstration of principles and guidelines governing the design and construction of pipelines in food industries.

FST 318 Food Microbiology I Lab

1 Unit

Introduction to the Food Microbiology including studies on the various equipment. Drawings would be applicable. Various media and all other materials used in the laboratory would be shown to the students. Studies on the preparation of media, media dispensation and aseptic methods would be done. Also technique of isolation of microorganisms mainly bacteria and fungi would be carried out.

FST 342 Food Microbiology II Lab

1 Uunit

Various staining techniques and biochemical tests used in identifying microorganisms would be carried out. Microbiological studies of food substances would be carried out. Food substances

include water, fish, meat, egg, cereals, roots & tubers, flour (wheat & yam). Cases of spoilage would be established and isolation and characterization of the organisms responsible would be carried out. Studies on food infection and poisoning would be carried out. Samples of water and cooked foods would be collected from hostels and cafeteria in the school and be subjected to microbiological analysis.

FST 325: Unit Operations in Food Processing

2 Units

Definition of unit operation and its importance in food processing and food engineering. Basic designs and operations of equipment used in food processing. Principles of operation of dryers. Pasteurization. Evaporation as a unit operation, design, and types of evaporators. Materials and Energy Balance. 30h (T)

FST 329: Unit Operations in Food Processing Lab

1 Unit

Practical applications of topics taught in unit operations in food processing.

FST 325: Food Machinery Maintenance

2 Units

Design features, fabrication of readily available construction materials with particular reference to Nigeria. Functions of equipment used in the food industry for cleaning, sorting, grading, size reduction, mixing, homogenization, filtration, distillation, centrifugation, etc. Electric motors and pumps used in food industries.

FST 411: Food Process Plant Design

3 Units

Food plant construction material strength and corrosion resistance with particular reference to specific metals, alloys, polymer, wood, ceramics, etc. under different environments. Corrosion prevention techniques and material selection. Plant layout in the food industry including

pipelines. Economics of process design, feasibility analysis and optimization techniques. Optimum design of food processing. Waste water and by-products disposal. Sanitary designs and construction of food processing plant. Lighting. Specific requirements of plant components (boiler room, rest rooms, cafeteria, front office, warehouse, etc.) Industrial visitation to food industries and a plant design project. 30h (T), 45h (P).

FST 412: Cereal Processing Technology

3units

Processing and utilization of major cereal. Milling of grains particle size analysis, utilization of products and by-products. Baking processes, Rheological properties of dough and ingredients. Protein enriched cereal products.

FST 413: Pilot work in Food Processing

3 Units

Processing of cowpea into flour and other products. Oils seeds and nuts to produce cakes and oils. Sugar cane conversion into sugar. Syrups. Vegetable milks from soya, melon and groundnut seeds. 30h (T), 45h(P).

FST 414: Food Analysis II

2 Units

Application of modern instrumental and computer-aided methods of analysis to the examination of food products; colorimetry, photometry, spectroscopy, chromatography, refractometry, polarimetry, adsorptimetry, and polarography. Preparative thin layer chromatography: separation of lipids of butter. Gas chromatography: GLC analysis of methyl esters. Gas chromatography/mass spectroscopy. Analysis of food flavours. Column chromatography: separation of proteins on sephadex columns. Infra red spectroscopy, Atomic absorption spectroscopy; determination of minerals in milk. 30h (T)

FST 415: Food Biotechnology**2 Units**

Scope, principle and practice of Biotechnology. Potential of Biotechnology in food processing and preservation. Biotechnology in waste management and environmental enhancement. Application of biotechnology of indigenous food production. Genetic improvement of fermentation processes, application of genetic engineering to modifications of raw materials and development of new food ingredients including enzymes, flavours, colours, sweeteners, emulsifiers, stabilizers etc. 30h (T)

FST 416: Food Dehydration Technology**2 Units**

Mechanisms in food dehydration. Trends in food dehydration. Detailed treatments in the principle, designs and construction of drying equipment such as solar dryer, spray dryer, drum dryer, fluidized bed dryer and cabinet dryer. Intermediate moisture foods. 30h (T)

FST 417: Pilot work in Food Processing Lab**1 Unit**

Production of cowpea and related products from legumes and oilseeds.

FST 418: Food Analysis II Lab**1 Unit**

Determination of vitamin using HPLC, Protein analysis- total volatile nitrogen in meat and fish, Fat analysis- FFA, TBA, Acidity, peroxide value. Dirts in oil, saponification value, unsaponifiable matter. Carbohydrate analysis- sugar determination using Lane and Eynon method. Starch determination- using phenol-sulphuric acid method. Determination of Beta Carotene and lycopene. Nutritionally important metal- iron in flour, heavy metals- Hg, P, Na & K

using flame photometer. Determination of pesticides/insecticide residue in foods e.g. organochlorine DDT. Aflatoxin in foods (groundnut).

FST 421: Industry-based Supervisor's Assessment

6 Units

This is one of the 4 components of the Students Industrial Work Experience Scheme (SIWES) where industry-based supervisors do assess students' performance: punctuality to work, availability, commitment and contribution of students to the operations in the industries where attached. Such assessments are submitted to the school to form part of SIWES overall grading.

FST 422 University Supervisor's Assessment

3 units

This is the assessment of the student's by the University Supervisors who visit the students at the places of attachment and evaluate their logbook and as well interact with the Industry based supervisor.

FST 423 SIWES Seminar Presentation

2 units

This is the assessment of student's SIWES defence. The student's ability to defend the report will be observed.

FST 424 Student's Report

4 units

This is the assessment of the report written by student during his/her SIWES. The evaluation is based on the quality of the write-up.

FST 511: Food Product Development

3 Units

Evaluation of factors involved in the development of new food product. Technical, sociocultural, economic, technological know-how. Availability of raw materials. Costing, consumer behaviour, and acceptability. Evaluation of product based on quality and cost. Codex alimentarius. GRAS compounds. Case studies in food product development. Characterization of the developed food product. Statistical assessment of food quality factors. 30h (T)

FST 520: Food Storage and Packaging Technology

3 Units

Definition, role and importance of food packaging. Principles of food packaging. Characteristics of food packages (metal, glass, paper and plastics). Structural quality and performance of packaging materials. Testing packaging materials. Packaging requirements of specific fresh and processed foods for local and international markets. Traditional food packaging. Legislation on packaging including nutrition labelling. 30h (T), 45h (P).

FST 512: Fish and Meat Technology

2 Units

Pre-slaughter examination of animals, inspection of carcasses. Meat quality assessment. Manufacture of sausages, bacons, corned beef, ground beef, suya. Handling methods in fish preservation: freezing, smoking, salting, canning, oiling, irradiation etc. Slaughter, carcass dressing and identification of meat and poultry cuts. Processing of meat, poultry, eggs and seafoods into meat products such as sausages, corned beef, balls, canned fish and other table-meats. Aging, tenderization, curing, smoking, freezing, canning, drying and other methods of preserving animal tissue. The meat industries in Nigeria. 30h (T), 45h (P).

FST 522: Dairy Processing Technology

2 units

Technology of milk and milk products e.g. liquid milk, filled milk, ice-cream, cheese, cultured milk, butter etc. Milk production practices including site, building and equipment selection. Organization and operation of the milk processing unit including milk collection, reception, standardization and heat treatment of milk. Whey as a by-product in milk management and application of HACCP in dairy industry.

FST 523: Food standards, Law and Quality Control I**3 Units**

Food standards and various laws and legislations for establishing food standards and grades. Sensory quality control assessment scores and data interpretation. Quality control of selected foods of plants and animal origins. GMP/GHP in food production and processing. HACCP concepts and principles. 30h (T), 45h (P).

FST 528: Food Standard Laws and Quality Control II**3 units**

Food quality parameters and specifications. Principles and methods of food quality control. Production line quality control including sampling plans. Construction of quality control charts. Statistical methods: analysis of variance (ANOVA) regression and correlation coefficients. Microbial quality control 30h (T)

FST 515: Food Equipment Design**3 Units**

Plant lay-out in food industry. Process flow sheets, food product processing, material and energy balance in process calculation, sanitation and safety in food plants. Economics of process design and optimization techniques. Optimum design of food processing plants. The principles of methods of process design. Methods of preparing design project report. Design and fabrication of simple food handling and processing equipment from the concepts of the processes involved. Principles guiding selection of materials of construction. 30h (T)

FST 521: Post Harvest Technology**3Units**

Post-harvest physiology of horticultural commodities. Effects of temperature, relative humidity and gaseous atmosphere on transpiration and physiological processes involved in ripening and senescence including respiration. Control of diseases organism (bacteria and fungi), vertebrate (rodents and birds) and non-vertebrates (insect and mites) in stored products. Appropriate post-harvest loss reduction measures for developing tropical countries. Ventilated common

storage. Simple refrigeration and cooling systems. Modified and controlled atmosphere storage. Low pressure (hypobaric) storage. Bulk handling, drying and storage of cereal grains and legumes including large scale storage of grains in silos and warehouses. 30h (T)

FST 519: Research Project I

3 Units

Proposal covering Introduction, Literature Review and Methodology of a selected topic under supervision of an academic staff. It will also involve an oral presentation of the proposed topic.

FST 529: Research Project II

3 Units

Presentation of the results and discussion of the researched topic. An oral presentation will also be made.

FST 511: Seminar

2 Units

Students will be asked to develop and make a formal oral presentation on selected topics in Food Science.

FST 512 International Food Policy

2 Units

Status of food and nutrition in the world; production levels of different items; pulse, tubers, cereals, meats, oils; population growth and food demand; structural changes and the demand for food in Africa and Asia; regionalism; food security and strategic grain reserves; agriculture, technological change, and the environment linkages between agriculture and nutrition, implications for policy research; case studies for consideration. 30h (T)

FST 513: Fish and Meat Technology Lab

1 unit

Evaluate shell eggs for quality using non-destructive and destructive methods; yolk index, albumen index, haugh unit. Production of egg powder and fortified eggs/Quality evaluation. Production and quality test of frozen chicken. Meat and fish canning and testing for Clostridium

botulinum. Production and evaluation of sausage rolls. Frozen meat production and quality evaluation. Smoked fish/meat evaluation. Chemical preservation of egg using coating and brining.

FST 514 Dairy Processing Technology Lab

1 unit

Chemical analysis of milk (fat alcohol, reassuring and acidity). Physical analysis (Cryoscopy point, density, dry residue, pH). Bacteriology test (coliform, total count, mould and yeast). Production of milk -based product such as yoghurt, ice-cream, warankasi,etc.

FST 515 Thermobacteriology

2 Units

Principles of food preservation: Low and High temperature treatment. Spoilage microbes of processed foods. Microbial cell structure and growth. Spore formation resistance to heat treatment. Thermal process evaluation, heat resistance, penetration and lethality. Measurement and calculation of thermal processes for industrial application. Quality degradation due to heat preservation. 30h (T)

FST 516 Toxic Constituents of Food

2 Units

Toxic and anti-nutritional factors in foods, effects of toxins on food. Hazardous foods. Toxic factors induced by processing. Safe evaluation. The use of experimental animals in toxicological studies. Chemistry, biosynthesis and physiological effects of food toxins. Methods of removal of food toxins. Manner of processing of toxic foods. 30h (T)

FST 517: Food Equipment Design Lab

1unit

Design and fabrication of basic processing equipment using locally available materials such as evaporators, distiller, crystallizer, spray dryers, mixing equipment, heat jacketed vessel, liquid fillers, thermocouple device, heat exchanger, etc.

FST 518 Selected Topics in Food Technology

2 Units

Particulate food transport systems with reference to sedimentation, centrifugation, fluidization, pneumatic and hydraulic transport. Comminution of solid foods including particle size

distribution, and analysis. Atomization of liquid. Detailed consideration of processes and equipment for dehydration and concentration. 30h (T)

FST 519 Nutrition in Health and Diseases

2 Units

Evaluation of nutritional status; Weaning foods, food intake and nutritional disorders such as arteriosclerosis, anaemia, ketosis, vitaminosis, hypertension, kidney and liver functions. Fibers and importance in foods. Improvement of nutritional status. Micronutrient fortification, IDA, IDD and VAD. 30h (T)

FST 520 Elements of Food Processing and Preservation

2 Units

Processing and preservation techniques. Low temperature preservation and use of preservatives. Considerations in the selection of equipment for food processing. Unit operations in food processing. 30h (T)

FST 521 Fermented Foods and Beverages

2 Units

Fermentation technology, fermenters. Bioreactors fermentation processes. Application in foods. Enzyme technology, purification of acids, brewing technology, baking technology. Application in foods. 30h (T)

FST 523 Advanced Food Analysis

2 Units

Application of modern instrumental methods of analysis to the examination of food products; atomic absorption spectrometer (AAS); high pressure liquid chromatography (HPLC); gas chromatography (GC); gas chromatography Mass spectrometer (GC/MS); infrared spectrometer (IR); Nuclear Magnetic Resonance Spectroscopy (NMR); preparation gas chromatography (PGC); NEAR infrared reflectance Spectroscopy. Theory and applications in the food industry; hands on demonstrations in the laboratory. Use of radioactive isotopes and bio-assays. 30h (T)

LIST OF STAFF

S/N	NAME	QUALIFICATION	DATE OF APPOINTMENT	RANK	STATUS
1	PROF. E. AKANDE	B.Sc, M.Sc. Ph.D.	2021	PROFESSOR	SABBATICAL
2	PROF. J. A. V. OLUMUREWA	B.Sc, M.Sc. Ph.D. (UI)	2022	PROFESSOR	SABBATICAL
3	DR. B.O. IFESAN	B.Sc, M.Sc. Ph.D	2022	READER	ADJUNCT
4	DR. O.A. AKINJAYEJU	B.Sc, M.Sc. Ph.D.	2021	SENIOR LECTURER	FULL TIME
5	DR. E. O. OYEKANMI	B.Sc, M.Sc. Ph.D. (UI)	2009	SENIOR LECTURER	FULL TIME
6	DR. JANET. O. ALABA	B.ENG,(KWASU) PGD, M.TECH Ph.D. (FUTA)	2010	SENIOR LECTURER	FULL TIME
7	DR. S.A. MALOMO	B.Sc, M.Sc. Ph.D. (UI)	2018	SENIOR LECTURER	ADJUNCT
8	DR. B. A. KELLY	Ph.D.	2013	LECTURER II	FULL TIME
9	DR. A.O. AGBOOLA	B.Sc, M.Sc. Ph.D.	2015	LECTURER II	FULL TIME
10	MRS. M. A. OGUNJEMILUSI	B.Sc, M.Sc.	2010	LECTURER II	FULL TIME
11	MISS. M. A. ANIFOWOSE	B.Sc, M.TECH.	2018	ASSISTANT LECTURER	FULL TIME

12	MR. OLUWASIJ I O. OLAITAN	B.Sc, M.Sc.	2018	ASSISTANT LECTURE	FULL TIME
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ADMINISTRATIVE STAFF

1	Mrs. Modupe Bukola AKINBOLAJI	OND, HND	2011	Confidential Secretary II	FULL TIME
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TECHNOLOGIST/LABORATORY STAFF

1.	Mr Adewale Solomon Adegbola	HND,	2016	Chief Technologist	FULL TIME
2	Miss O.E. Omoseyin	B.Sc	2015	Technologist II	FULL TIME