

**DEPARTMENT  
OF  
PLANT SCIENCE AND BIOTECHNOLOGY**



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BIOTECHNOLOGY**

## **DEPARTMENT OF PLANT SCIENCE AND BIOTECHNOLOGY**

The Department offers a Degree programme leading to the award of the Bachelor of Science (Plant Science and Biotechnology)

### **PHILOSOPHY**

The Department aims at training biologists in life processes in plants and micro-organisms as it relates to our natural environment, and to harness these natural resources for national development.

### **Objectives**

- (a) To produce graduates with the relevant skills and knowledge necessary for product research and teaching.
- (b) To produce graduates with requisite biological knowledge and techniques necessary for industries such as brewing, food processing and preservation, pharmaceuticals, water works, petro-chemical, forestry, ecosystem conservation and wood processing.
- (c) To produce students, with the knowledge for monitoring environmental pollution.
- (d) To provide courses in biological sciences to students of other departments and faculties whose degree options require a working knowledge of Plant Science and Biotechnology.

There is only one degree option and there is no waiver whatsoever. Prior to creation of Plant Science and Biotechnology as a Department, the waiver allowed was a pass in physics and not in English. A pass in physics is still accepted but every student wishing to study Plant Science and Biotechnology must possess credit passes in English Language besides Biology, Chemistry, Mathematics and two other subjects. A credit pass in Agricultural Science is not a substitute for Biology.

## **I. ADMISSION REQUIREMENT (UME).**

Any candidate who wishes to apply for a B.Sc. degree in Plant Science and Biotechnology must have credit passes in Mathematics, Biology, Chemistry, English language and any other subject. Agricultural science is not a substitute for Biology, a credit pass in physics is an added advantage but not substitute for Mathematics.

## **DIRECT ENTRY**

Besides the basic O' Level requirements, candidates seeking direct entry admission into the Department must have 2 'A' Level or HSC Passes in the relevant science including chemistry, Biology, Agricultural Sciences and one other subject.

## **II. CATEGORIES OF COURSE IN THE DEPARTMENT.**

There are basically four categories of courses in the Department and by extension in the University. These are core, required, elective and pre-requisite courses.

### **(A) CORE COURSES (C)**

Every student in the Department takes core courses and must pass them before graduation.

### **(B) REQUIRED COURSES (R)**

These courses are mounted by the University and must be taken by every student in the Department. However, failing a required course may not prevent a student from graduating.

### **(C) ELECTIVE COURSES (E)**

These are courses which a student takes on the advice of his/her course adviser but may not be passed.

### **(D) PRE-REQUISITE COURSES**

These are courses the knowledge of which is necessary before taking other specified higher level courses. A student is deemed to have obtained a pre-requisite knowledge if he/she obtains a work not less than 30% but will not be credited with any grade points in the course concerned, except he/she scores a minimum mark of 45%. (D)

### **(E) GENERAL INFORMATION ON REGISTRATION OF COURSES.**

*Every student is strongly advised to registered all failed lower level courses before proceeding to register courses at higher levels. The maximum number of units a student is allowed to register per session is 48 while the minimum is 30.*

#### **IV. QUANTIFICATION OF COURSES.**

- i. Courses are quantified in credit units or units for short. A unit equals 15 hours of lecture (i.e. 1 hour a week for 1 semester) or 15 hours of tutorials or 45 hours of laboratory/field work.
- ii. No course should be less than 2 units and no lecture course should be more than 3 units.
- iii. Courses that span over both semesters (such as practical courses) will be credited at the end of the second semester.

#### **V. COURSE ADVISER**

A course adviser is an academic staff who approves student's registration forms for a particular level. He advises students individually and ensures that their choices are in line with the Department's requirements. Each level has a course adviser.

#### **(F) Examination procedure**

- i. Courses taken in a semester shall be examined at the end of the semester and sessional courses will be examined at the end of the session.
- ii. Only students who are duly registered for courses in a given semester and have met their financial obligations to the University shall be allowed to sit for examinations in those courses.
- iii. Students who took examination for courses not duly registered for shall not be credited with grades or units for those courses.

#### **VI. COURSE ASSESSMENT**

- i. Each course assessed must consist of two components namely, continuous assessment (20%-30%) and examination (between 70%-80%)
- ii. The pass mark for every course is 45%.
- iii. **Courses are graded as shown below:-**

Scores	Grades	Grade Points
70-100	A	5
60-69	B	4
50-59	C	3
45-49	D	2
00-44	F	0

H (i) Students' results are to be prepared at the end of every semester, reflecting raw marks and grades, total units taken, total units passed and total units failed. The same applies at the end of each session for every level, indicating total units passed and failed as the case may be, sessional GPA and cumulative units passed, the CGPA and remarks of proceeding or probation or withdrawal from the degree programme.

ii. At the end of the degree programme, students' results are prepared showing details of the session's performance, including list of course failed for the session as well as the cumulative performance indicating class of degree (where applicable) as shown below.

<b>CGPA</b>	<b>CLASS OF DEGREE</b>
4.50-5.00	1 <sup>ST</sup> Class Honours
3.50-4.49	2 <sup>nd</sup> Class Honours Upper Division
2.40-3.49	2 <sup>nd</sup> Class Honours Lower Division
1.50-2.39	Third Class Honours

Both the sessional GPA and CGPA are calculated using the weighted grade point. The weighted grade for the course is the product of the point and the units for the course. Thus a student who scores 62% in a three-unit course has a grade point of 4 and a weighted grade point of  $3 \times 4 = 12$  for that course. Thus the sessional G.P.A is calculated from the formula.

$$\text{Sessional G.P.A} = \frac{\text{Total weighted points in the Session}}{\text{Total Units Taken}}$$

Similarly, the CGPA is calculated from the formula

$$\text{CGPA} = \frac{\text{Total Weighted points for all the Sessions}}{\text{Total Units Taken for all the sessions.}}$$

Provided that all courses taken that are relevant to a particular degree programme are used in the computation of the various averages.

In computing CGPA, performance in all courses registered for and taken in the course of a particular degree programme must be used.

(h) The inclusion of the column (for cumulative units taken) in each of the formula for presentation of results to Senate and to Faculty expressed to the nearest integer, of the CGPA and the cumulative unit taken where applicable.

(i) As an example, consider a student who has taken seven courses in a semester with the following details:

	Unit (a)	Mark (b)	Grade (c)	Grade Point (d)	Weighted Grade Point (a)x(d)
Course 1	3	62	B	4	13
Course 2	3	51	C	3	9
Course 3	3	45	D	2	6
Course 4	2	33	F	0	0
Course 5	3	45	D	2	6
Course 6	2	52	C	3	6
Course 7	3	45	D	2	6

Total Units Taken = 19

Total weighted Grade Point = 46

If the total units taken for the second semester is 25 with a total weighted grade point of 64 the sessional GPA is given by,

$$\text{Sessional G.P.A} = \frac{46 + 64}{19 + 25} = \frac{110}{44} = 2.500$$

A student may have the following results over four sessions.

	Weighted Grade Point	Total units	Cumulative Weighted Grade Point	Cumulative Units	CGPA
Year I	92	38	92	38	2.421
Year II	114	40	206	78	2.641
Year III	122	44	328	122	2.689
Year IV	117	42	445	164	2.71

Thus, the CGPA at the point of graduation is 2.71 hence the student will come up with Second Class Lower Division Degree.

(j) There is no reference in any course examination. Long vacation semester has been abrogated.

(k) There is no repeat in the course system. Therefore, a student cannot re-register for a course already passed.

(l) A student must accumulate at least 30 units per level before graduation.

(m) There is no weighting of sessional GPA in the computation of CGPA.

(n) In the computation of the CGPA all courses taken in the session will be used, and therefore no course will be disregarded or discountenanced.

## **VII. STUDENT WORK LOAD**

(a) A full-time student must register for a minimum of 30 units and a maximum of 48 units per session. This implies that a student should normally register for minimum 15 units and a maximum of 24 units per semester.

A student who is unable to take a course examination in a particular course due to approved absence will be required to re-register for the course at the next available opportunity. Such a student will not normally be allowed to take any course for which the incomplete course is a pre-requisite. Please note that a student cannot exceed the approved workload.

## **VIII. PROBATION**

(a) A student who makes a CGPA of 1.50 or more at the end of the session will proceed to the next level of degree programme for which he/she registered.

(b) A student who makes a CGPA of less than 1.00 at the end of the session will be on probation for the following session to enable him/her improve on the CGPA. During that session he must register for the appropriate core courses and other courses he/she has the pre-requisites.

(c) A student on probation during a session who makes a CGPA of less than 1.00 at the end of the session must withdraw from the degree programme for which he/she is registered.

(d) If the student changes to a new degree programme and obtains a CGPA of less than 1.00 in the new degree programme he/she will again be on probation. If however he/she obtains a CGPA of less than 1.00 a second time in the new Degree programme he/she will be asked to withdraw from the university.

## **IX. TRANSFER**

(a) Every student seeking transfer from one degree programme to another must complete the necessary forms within the stipulated time.



(b) All courses taken in the previous degree programme that are deemed relevant to the new degree programme by the offering department will be used for the computation of the CGPA for the new degree programme.

(c) All regulation in respect of the new degree programme concerning core courses, required courses, etc, must be met before graduation.

## **X. HONOURS CLASSIFICATION**

(a) No student shall qualify for the award of an Honours degree of the university if he/she spends more than two sessions (four semesters) beyond the normal periods allowed for the degree programme.

(b) No student who has transferred more than twice will be qualified for an honours degree.

## **XI. STUDENT REGISTRATION**

(a) The first week of the period for course registration during the first semester of each session shall be lecture- free to enable all registration official attend to all student fully.

(b) During this period the registration time will be at least from 9.00am to 2.00pm daily.

(c) Every level in the department will be assigned one or more lecturers to act as registration officers for students in the level throughout the duration of the exercise.

(d) Student registration for any semester course may be adjusted by the use of Add and Delete forms within the first two weeks of the commencement of lectures during the semester.

(e) Late registration may be allowed in the third week of the session upon payment of a penalty fee.

## **XII. ABSENCE FROM EXAMINATION**

(a) Candidates must present themselves at each examination for course for which they have registered.

(b) Candidate who fail to do so for reasons other than certified ill-health or accident or for any other reason acceptable to the Dean shall be deemed to have failed that examination, i.e. would have F grade.

(c) For the avoidance of doubt, failure to take cognizance of changes in the examination timetable and such other lapses on the part of the candidates shall not be accepted as reasonable excuse for absence.

(d) A candidate who falls ill during an examination shall report to the Director of the University Health Services who shall subsequently submit a report in writing to the Dean of the faculty after treating the candidate.

- (e) A candidate who is unable to take an examination on grounds of illness confirmed by the University Director of Health services, on ground specified above may be allowed to sit for the examination at the next available opportunity
- (f) When necessary, on ground of ill health and certified by the Director of Health Services, an examination can be taken in the Hospital or related location as approved by the Dean and invigilated.

### **XIII. IMPORTANT EXAMINATION REGULATIONS**

- (a) Students shall not be admitted into the examination hall if they have not been duly registered by the various faculty/faculties having fulfilled the prescribed conditions of the course of study.
- (b) Eligible candidates shall report at the stipulated examination halls fifteen minutes before the start of the examination.
- (c) No candidate shall be allowed into the examination hall after 30 minutes of the start of the examination.  
No candidate shall be allowed to leave the examination within 30 minutes of the conclusion of the examination.
- (d) No candidate shall be allowed to withdraw from the examination hall within 30 minute of commencement of examination.
- (e) Candidates may go to the toilet, etc, during examination, provided that they are accompanied throughout the periods of absence by a suitable officer, such candidate must not be allowed any extra time by reason of such absence.
- (f) The chief invigilator may, under special circumstance accept a candidate into the examination hall after 30 minutes of the start of the examination if he/she is satisfied that there are reasonable grounds for the lateness. A report of this situation must be formally made to the Chief Examiner.
- (g) Candidates shall not walk out of the examination hall with any answer sheet/booklets used or unused.
- (h) Candidates shall comply with any instruction given by the Chief Invigilator as to the submission of their answer sheets at the conclusion of the examinations.
- (i) It shall be the responsibility of each candidate to ensure that his/her examination sheets are duly accounted for to the Chief Invigilator at the examination hall.
- (j) All rough notes, scrap sheets, draft answer, etc which do not form part of the definitive answer sheets must be submitted after appropriate cancellation, to the chief invigilator with the definitive answer sheet at the conclusion of the examination.
- (k) Candidate shall not talk to one another, give or receive from one another any form of assistance, pens, eraser pencils, ruler, etc.

- (l) All questions pertaining to the examination must be directed to the Chief Invigilator or any of the accredited invigilators.
- (m) The Chief invigilator shall report any examination misconduct formally to the Chief Examiner/Dean of the appropriate faculty as specified by Senate.
- (n) Any contravention of any of the above rules and regulations shall constitute examination misconduct. All candidate shall comply with these regulations in their own interest.
- (o) Invigilators shall tell the candidates the exact time of starting an examination and thereafter inform them of the time at reasonable intervals.
- (p) Invigilators shall ensure that personal effects such as bags, electronic organizers, textbooks, scrap notes, etc are not brought into the examination hall by the candidates and that unused answers scripts are not taken out.
- (q) Silence shall be maintained throughout the duration of an examination.
- (r) Invigilators shall ensure that all candidates sign the Attendance Register.
- (s) At the end of an examination, each invigilator shall collect and count the scripts before handing them over to the Chief Invigilator who shall sign the answer booklets.

#### **XIV. CONFERMENT OF DEGREE**

After the recommended examination result from the Faculty Board have been approved by Senate, successful candidates shall be admitted whether in person or in absentia to the degree of the University at the convocation for the award of degrees, and thereafter issued with certificate under the common seal of the University.

**100 LEVEL**

<b>FIRST SEMESTER</b>				
<b>S/N</b>	<b>COURSE</b>	<b>COURSE TITLE</b>	<b>UNITS</b>	<b>STATUS</b>
1	BIO 101	General Biology I	3	C
2	CHM 101	General Chemistry I	3	C
3	MTH 101	Elementary Mathematics I	3	C
4	PHY 101	General Physics I (Mechanics)	3	C
5	CSC 101	Intro to Computer Science	2	C
6	GST 101	Use of English and Library Studies	3	C
7	GST 101	Philosophy and Logic	2	C
	<b>Sub Total Units</b>		19	
<b>SECOND SEMESTER</b>				
1	PSB III	Plant Morphology	3	C
2	BIO III	General Biology II	3	C
3	CHM II2	General Chemistry II	3	C
4	GSTIII	Nigerian People and Culture	2	C
5	MTH II2	Elementary Mathematics III (Calculus)	3	C
6	GST II2	History and Philosophy of Science	2	C
7	PHY 103	General Physics (Laboratory)	2	C
8	CHM I02	Practical Chemistry	2	C
9	PHY III	General Physics III (Heat/Kinetic Theory)	2	C
	<b>Subtotal Units</b>		22	
	<b>Sessional Total Units</b>		<b>41</b>	

**200 LEVEL**

<b>FIRST SEMESTER</b>				
<b>S/N</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>UNITS</b>	<b>STATUS</b>
1	BIO 201	Introductory Ecology	3	C
2	PSB 201	Seedless Plants	3	C
3	PSB 203	Introductory Plant Biotechnology	2	C
4	BCH 201	General Biochemistry I	3	C
5	PSB 202	Plant Physiology I	2	C
6	CHM 203	Organic Chemistry	3	C
7	PSB 204	Mushroom Culture Technology	2	C
8	ENT 201	Entrepreneurship 1	2	C
9	MEL 106	Basic French	2	R
10	ZLY 201	Lower Invertebrates	3	C
	<b>Subtotal units</b>		25	
	<b>Elective</b>			
	MCB 201	General Microbiology	2	E
	BIO 202	General Physiology	2	E

<b>SECOND SEMESTER</b>				
1	BIO 211	Genetics 1	3	C
2	BIO 212	General Techniques in Plant Science	3	C
3	BCH 211	General Biochemistry II	3	C
4	PSB 212	Plant Taxonomy	3	C
5	PSB 213	Seed Plant Anatomy	3	C
6	GST 222	Peace and conflict Resolution	3	C
7	ENT 211	Entrepreneurship 11	2	C
8	MEL 106	Basic French II	2	R
	<b>Subtotal units</b>		22	
	<b>Sessional Total Units</b>		<b>47</b>	

### 300 LEVEL

<b>FIRST SEMESTER</b>				
S/N	COURSE CODE	COURSE TITLE	UNITS	STATUS
1	BIO 301	Genetics II	3	C
2	PSB 301	Plant Ecology/Field Course	3	C
3	PSB 302	Fungal physiology	3	C
4	PSB 303	Plant Systematic	3	C
5	PSB 304	Plant Physiology II	3	C
6	PSB 305	Biostatistics	3	C
7	PSB 306	Introductory Storage Technology	2	C
8	PSB 307	Principles and Techniques in Plant Biotechnology	3	C
9	PSB 308	Phycology	3	C
	<b>Total Units</b>		26	
<b>SECOND SEMESTER</b>				
1	PSB 311	INDUSTRIAL Attachment	15	C
	<b>Total Units</b>		15	
	<b>Sessional Total Units</b>		<b>41</b>	

### 400 LEVEL

<b>FIRST SEMESTER</b>				
S/N	Course Code	Course Title	Units	Status
1	BIO 401	Applied Storage Technology	2	C
2	PSB 401	Plant Breeding	3	C
3	PSB 402	Soil Science	2	R
4	PSB 403	Seminar	2	C
5	PSB 404	Population Ecology	3	C
6	PSB 405	Mycology II	2	C

7	PSB 406	Conservation and Natural Resource Management	3	C
8	PSB 407	Limnology	3	C
9	PSB 408	Economic Botany	2	C
	<b>Total Units</b>		22	
	Elective			
	PSB 409	Evolution	2	E
	<b>Total Units</b>			
<b>SECOND SEMESTER</b>				
1	BIO 411	Molecular Techniques of Plant Science and Biotechnology	2	C
2	PSB 411	Plant Pathology	3	C
3	PSB 412	Research Project	6	C
4	PSB 413	Environmental Plant Biotechnology/Tissue Culture	3	C
5	PSB 414	Comparative Plant Anatomy/Embryology	3	C
6	PSB 415	Plant Growth and Development	2	C
	<b>Total Units</b>		19	
	<b>Sessional Units</b>		<b>41</b>	
	<b>Elective</b>			
	PSB 416	Ethnobotany	2	E

## 100 LEVEL

### **BIO 101: GENERAL BIOLOGY 1 (3 UNITS) CORE**

Cell structure and organization; functions of cellular organelles; diversity, characteristics and classification of living things, general reproduction, interrelationship of organism; heredity and evolution; elements of ecology and types of habitats.

### **BIO 111: GENERAL BIOLOGY 11 (3 UNITS) CORE**

A generalized survey of the plant and animal kingdoms based mainly on study of similarities and differences in the external features; ecological adaptation of these forms.

### **PSB 111: PLANT MORPHOLOGY (3 UNITS) CORE**

A survey of the plant kingdom, structure, reproduction, classification and evolution of different groups. Organization of the plant body. Morphology and modification of plant organs, roots, stem, leaves, flowers, fruits and seeds.

## 200 LEVEL

### **PSB 203: INTRODUCTORY PLANT BIOTECHNOLOGY (2 UNITS) CORE**

Historical development, Applications and implications of molecular biology including ethical and social controversies, Definition, origin and history of plant biotechnology, Basic terminologies used in biotechnology. Introduction to basic *in vitro* techniques. Concept of cell

totipotency. Explants for *in vitro* culture (embryo, seed, meristem, organs etc). Tissue culture media preparation and storage. Sterilization techniques (labware/media/explants). Cultural conditions (chemical and physical environments). Isolation of nucleic acids and proteins. Introduction to genes and genomes. Applications of biotechnology in industries, agriculture, health, environment, forensic, biological warfare etc

**PSB 204: MUSHROOM CULTURE TECHNOLOGY (2 UNITS) CORE**

History of mushroom cultivation. Collection, identification and preservation of mushrooms, Biology, ecology and economic importance of mushrooms, Nutritional and medicinal values of edible mushrooms; Poisonous mushrooms. Types of edible mushrooms available in Nigeria Principles of mushroom cultivation, Pure culture: Medium, sterilization, preparation of spawn, multiplication, Mushroom pest and diseases, Post harvest handling of mushroom, Economic and social impact of mushroom.

**BIO 201: INTRODUCTORY ECOLOGY (3 UNITS) CORE**

The general nature of ecosystems; energy flow and biochemical cycles in ecosystems. Ecology of populations and communities. The organization and dynamics of ecological communities. The distribution of plants and animals over the surface of the earth with special reference to Nigeria plants and animals.

**PSB 201: SEEDLESS PLANTS (3 UNITS) CORE**

The structure, reproduction, ecology, classification and economic important of algae. Bryophytes and pteridophytes and their interrelationship.

**PSB 202: INTRODUCTORY PLANT PHYSIOLOGY (3 UNITS) CORE**

Plant water relations; absorption and translocation of water and mineral ions, transpiration, translocation of organic solutes, mineral nutrition; macronutrients and experiments, nutrient deficiency symptoms, stomata/ physiology Seed germination and dormancies.

**BIO 202: GENERAL PHYSIOLOGY (3 UNITS) ELECTIVE**

Physical and chemical processes in animal and plant physiology.

**BIO 211: GENETICS 1 (3 UNITS) CORE**

Hereditary and non-hereditary characteristics. Probability and tests of goodness of fit. Quantitative inheritance, variation in genome structure. Introduction to population genetics.

**BIO 212: GENERAL TECHNIQUES IN PLANT SCIENCE (3 UNITS) CORE**

Microscopy, Preparation of slides, Sectioning of plant and tissues techniques in culturing plant tissues, Photometry, Chromatography, Conductometry, Collection and Preservation of Plant Specimens, Herbarium Techniques. Biological Drawings

**PSB 212: PLANT TAXONOMY (3 UNITS) CORE**

History and development of taxonomy. Taxonomic principles and characters, the classification of selected flowering plant families. Nomenclature classification and identification. Key construction. Rules of International Code of Botanical Nomenclature (ICBN). Floral formula and

floral diagram, Collection, storage, and retrieval of taxonomic evidence. Character and character states.

### **PSB 213: SEED PLANTS AND ANATOMY (3 UNITS) CORE**

A general survey of seed plants, morphology, evolution of the different groups. Organization of the plant body, the roots, stem, leaves, flowers, fruit and seed, plant organs. Reproduction, sexual and vegetative reproduction.

### **300 LEVEL**

#### **BIO 301: GENETICS II (3 UNITS) REQUIRED**

Aspect of human genetics. Pedigree analysis. Further consideration of various deviations from basic principle; Gene interaction. Mutation. Recombination in prokaryotes and viruses. Sex-linked inheritance. Elements of human genetics; inborn errors of metabolism; blood group polymorphism; medical genetics; pedigree analysis. Introductory cytogenetics; introduction to population genetics

#### **BIO 302: PLANT BIOTECHNOLOGY: PRINCIPLES AND TECHNIQUES 1**

Definitions and concepts in plant Biotechnology, Development and issues in plant Biotechnology, Key principles and terminologies in plant biotechnology: micropropagation, virus free plants, somaclonal variations, haploid plants, embryo rescue, somatic hybrids and cybrids, germplasm conservation, molecular markers, Techniques in general biotechnology methods - Safety Procedures , Preparation of Solutions, Disposal of Buffers and Chemicals, Equipments , Micropipets , Using a pH meter , Autoclave operating procedures, Uses of spectrophotometer, Agarose and Polyacrylamide gel electrophoresis. Cell culture Methods - Types of cells grown in culture, Preservation and storage, maintenance, Tissue culture methods, Determining cell counts.

#### **PSB 301: PLANT ECOLOGY/FIELD COURSE (3 UNITS) CORE**

Description and classification of vegetation types in Nigeria. Quantitative and qualitative methods for the study of vegetation. Vegetation dynamics, autecology. Synecology, ecological groups, hydrophytes, aerophytes, epiphytes and mesophytes. Effect of physical environment on plants, climatic, biotic and topographical factors.

#### **PSB 302: FUNGAL PHYSIOLOGY (3 UNITS) CORE**

Structure, life cycles, physiology and classification of fungi. Fungi of economic importance, physiology of fungi germination and dormancy, growth and sporulation. Composition of fungal cells, Liberation and germination of spores, Growth and reproduction, Nutrition and metabolism, Synthesis of lipids and proteins and Vitamin requirement and their production. Microbial antagonism, Biochemical genetics, Protoplasmic activity: Dimorphism

#### **PSB 303: PLANT TAXONOMY (3 UNITS) CORE**

Taxonomy and its significance, principles and concepts in plant taxonomy. Construction and use of taxonomic keys, experimental taxonomy with special emphasis on cytotaxonomy, chemotaxonomy and palynology.



**PSB 304: METABOLIC PLANT PHYSIOLOGY (3 UNITS) CORE**

Enzymes, proteins and amino acids. Photosynthesis, light and dark reactions. C-A carboxylic acid pathway, crassulacean acid metabolism, formation of sucrose and starch, environmental and agricultural aspects of photosynthesis. Respiration, Krebs cycle, electron transport system and oxidative phosphorylation, the pentose phosphate pathway. Assimilation of nitrogen and sulphur cycles. Lipids and aromatic compounds e.g. phenolic and alkaloids.

**PSB 305: BIOSTATISTICS (3 UNITS) CORE**

Elements of statistics, experimental design. Data collection, collation, analysis and interpretation. Tests of significance in research and statistically designed experiments, review of research methodology. Field experimentations. Statistical inferences.

**PSB 306: INTRODUCTORY STORAGE TECHNOLOGY (2 UNITS) CORE**

Various traditional and modern methods used for the storage of diverse agricultural products with particular emphasis on dry and wet food stuff. Principles and methods of preservation of food crops pest and methods of control. Pest of stored timber, selected diseases of timber, root crops, cereals, legumes, vegetables and fruits. Biological deterioration of stored products, pre- and post harvest storage techniques.

**PSB 307: PHYCOLOGY**

Algal classification, structure and reproduction. Life histories of main groups. Phytoplankton, physiology and ecology of algae. Evolution and adaptation of algae. Algae diversity (Periphyton, Epiphyton, Epilithic, Episamic and Benthic algae-freshwater, oceanic and estuarine algae). Practical (Use of keys, sampling techniques of phytoplankton, bentic algae and periphyton).

**PSB 311: INDUSTRIAL ATTACHMENT (15 UNITS) CORE**

Industrial experience in any agricultural, plant science or biotechnology related establishment. This is to take place for six months during the second semester of 300 level, proceeding the final year of the programme.

**400 LEVEL****BIO 401: APPLIED STORAGE TECHNOLOGY (2 UNITS) CORE**

Stored product protection and preservation including spraying, dusting, fumigation and smoking. Formulation and application of insecticides and fungicides for the control of crop product pest and diseases. Prevention of storage losses and assessment of damage and crop losses.

**PSB 401: PLANT BREEDING (2 UNITS) CORE**

The objectives of plant breeding system. Polyploidy as a plant breeding tool. Breeding for disease resistance. Various aspects of plant propagation and nursery management, Plant breeding, origin and domestication, cross and self-pollination, breeding methods, backcross breeding, recurrent selection, heterosis, pureline breeding and mass breeding, chromosome manipulation

**PSB 402: SOIL SCIENCE (2 UNITS) REQUIRED**

Classification and characteristics of soils. Chemical components and analyses of soils and plant tissues, plant- soil- water - relationships.

**PSB 403: SEMINAR (2 UNITS) CORE**

Students are to carry out a detailed study of a selected topic or give a report on an ongoing project. This is to expose the students to independent research experience. The topic will be publicly discussed by the student in an organized seminar setting.

**PSB 404: POPULATION ECOLOGY (3 UNITS) CORE**

Ecology of populations and communities. The organization and dynamics of ecological communities. The distribution of plants and animals over the surface of the earth with special reference to Nigerian plants and animals. Population growth and regulation.

**PSB 405: MYCOLOGY 11 (2 UNITS) CORE**

Structure, classification and physiology of yeast,. Fungi in industry; fungal pathogens of animals and man. Cultivation of edible mushrooms.

**PSB 406: CONSERVATION AND NATURAL RESOURCE MANAGEMENT**

The concept of conservation and its biological significance. Conservation policy formulations and means of enforcements. Identification of endangered species and Eco-Tourism, principles and objectives.

**PSB 407: LIMNOLOGY (3 UNITS) CORE**

Limnology: past, present and future. The structure of aquatic ecosystems; physio-chemical factors of aquatic ecosystems, nutrients. Phytoplankton, zooplankton and zoobenthos, fish and fisheries; food-chain dynamics.

**PSB 408: ECONOMIC BOTANY (2 UNITS) CORE**

A study of the Botany and cultivation of plant species with particular reference to Nigeria economic plants. At least three members of the following groups: cash crops, legumes, tuber crops, spices and cereals.

**PSB 409: EVOLUTION (2 UNITS) ELECTIVE**

Distribution of organisms in time and space. Reviews of theories of evolution e.g. Darwinian theory of evolution by natural selection. Neo-Lamarckism and Neo-Darwinism. Natural selection as evidence of evolutionary processes of fossils, geographical distribution (speciation), comparative anatomy and embryology; genetic evidence e.g. gene factor in the origin of diversity, industrial melanism, sickle cell anemia, future of man.

**PSB 411: PLANT PATHOLOGY (3 UNITS) CORE**

Techniques of plant pathology, principles and practices of plant pathology. Plant infection, causal agents of diseases, types of plant diseases. Plant disease control: quarantine practices, breeding for resistance, structure and action of fungicides. Resistance mechanism. Pre and post harvest diseases of economically important crops. Disease of crops in storage, seed borne pathogens.

**PSB 412: RESEARCH PROJECT (6 UNITS) CORE**

This is designed to give students an opportunity to carry out a small independent research project approved by the Departmental Board of studies and under the supervision of one or more members of staff.

**PSB 413: ENVIRONMENTAL PLANT BIOTECHNOLOGY (3 UNITS) CORE**

Principles of Environmental Plant Physiology and Stress Physiology. The role of environmental factors in plant physiological processes; energy supply and plant reactions to photosynthetically active radiation. Physiology of plant under stress including effects of stress, stress responses; Drought (or water stress) effects, mechanism of drought resistance; heat stress mechanisms of resistance; low temperature and freezing effects and mechanism of tolerance; attitude and pollution.

**PSB 414: COMPARATIVE PLANT ANATOMY OF SEED PLANTS (3 UNITS) CORE**

Characteristics and classification of tissue. Tissue system, organization of meristems, evolution of vascular tissue, comparative wood anatomy. Anatomical adaptations to specialized habitats. Applied plant anatomy. Embryo and endosperm: Endosperm types, structure and functions; Dicot and monocot embryo; Embryo-endosperm relationship.

**PSB 415: PLANT GROWTH AND DEVELOPMENT (2 UNITS) CORE**

Plant growth and development. Hormones and growth regulators, auxins, gibberellins, cytokinins, ethylene and abscisic acid. Plant tissues culture. The physiology of flowering: phytochrome and photomorphogenesis, photoperiodism and vernalization.

**BIO 411: MOLECULAR TECHNIQUES OF PLANT SCIENCE AND BIOTECHNOLOGY (2 UNITS) CORE**

Plant biotechnology, Principles and Techniques: what, why, how. From DNA to proteins, Genes and expression, Genes and genomes, Plant improvement- traditional and molecular plant breeding processes. Genetic modification of plants (Gene transfer system, case studies and regulatory and ethical issues), Genomics, molecular markers, molecular genetics, Germplasm conservation, metabolic engineering of plant quality traits such as mineral and protein content, carbohydrate composition, cisgenesis, where only the plants own genes are used in developing GMO, molecular based breeding methods, including selection based on phenotype and genotype, genomic selection in plant breeding, Genetic mapping, proteomic and genomic tools, Polymerase Chain Reaction (PCR) and applications, Recombinant DNA technology, The basics of cloning, Plant genomic DNA isolation and DNA quantification techniques, DNA sequencing and databases.

**PSB 417: ETHNOBOTANY (2 UNITS) ELECTIVE**

History and current trends in ethnobotany. Ethnobotanicals, uses of plants to mankind, preservation of plants for man's use. Identification of local plants for biotechnological and antimicrobial activities. Ethnobotanical survey, preparation of plant and plants extracts.

**ACADEMIC STAFF**

S/N	NAME	Qualifications	Status	
1	E.A. Ogie-Odia	B. Sc; (Ado-Ekiti); M.Sc (Benin) Ph.D (Ekpoma)	Senior Lecturer/ Ag. HOD	Full Time
2	E.E. Okoegwale	B.Sc. (Calabar), M.Sc. (Ibadan), Ph.D(Benin)	Professor	Full Time
3	B.O. Obadoni	B. Sc. (Ekpoma), M.Sc. (Ibadan) Ph.D (Ekpoma)	Professor	Full Time
4	O. Ekhaton	B.Sc. (Ekpoma), PGDE, M.Sc. Ph.D (Benin)	Senior Lecturer	Full Time
5	D.A. Esegbe	B.Sc. (Ekpoma),M.Sc. (Ibadan) Ph.D (Ekpoma)	Senior Lecturer	Full Time
6	Okoooh Gloria	B.Sc. (Ekpoma), M.Sc, Ibadan, Ph.D (In View)	Lecturer II	Full Time
7	Imade, Francis Nosakhare	B.Sc. (Ekpoma), M.Sc., Ibadan, Ph.D (In View)	Lecturer II	Full Time
8	Omoruyi, Osasere Abike	B.Sc., M.Sc, Ph.D (Benin)	Lecturer II	Full Time
9	Oboh, Eugene	B.Sc. (Ekpoma), M.Sc (In View)	Graduate Assist.	Full Time

**ASSOCIATE ACADEMIC STAFF FROM OTHER DEPARTMENTS  
WITHIN THE FACULTY**

S/N	NAME	Qualifications	Status
1	Egbon, E.E	B.Sc. (Ed), M. Sc (Benin) Ph. D (Ekpoma)	Reader
2	Bamuza- Pemu, E.E	B. Sc; M. Sc (Ibadan); Ph. D (South Africa)	Senior Lecturer
3	Inianghe, O.M	B. Sc , M. Sc, Ph. D (Ilorin)	Senior Lecturer
4	Isaac, C	B.Sc. (Ekpoma) M. Phil (Ghana); Ph.D (Ekpoma)	Senior Lecturer
5	Alaiya H.T	B.Sc. M. Sc (Ekpoma)	Lecturer I
6	Izegaegbe, J.I	B. Sc (Ekpoma), M. Sc (Ife), Ph. D (South Africa)	Lecturer I

### TECHNICAL AND ADMINISTRATIVE STAFF

<b>S/N</b>	<b>Name</b>	<b>Qualifications</b>	<b>Status</b>
1	Mr. A.A. Oduwole	HND (Ibadan), M.Sc (Ekpoma) FNISLT	Senior Chief Technologist
2	Mr. F. Ainojietine	WASC, B.Sc (Ekpoma)	Assistant Lab. Supervisor
3	Mr. K. Enaifoghe	WASC, Diploma	Head Lab. Assistant
4	Mrs. .F. Oaikhena	FSLC	Senior Messenger/Cleaner