

**BAUCHI STATE  
UNIVERSITY, GADAU  
  
FACULTY OF SCIENCE  
  
DEPARTMENT OF  
BIOLOGICAL SCIENCES  
  
STUDENTS HANDBOOK**

## **TABLE OF CONTENT**

Title Page	i
Table of Contents	ii
Forward	1
Department of Biological Sciences	1
Degrees in View and Objectives	1
Brief Historical Background of the Department	2
General Information	3
Deanery of Faculty of Science	4
<b>CHAPTER ONE</b>	
1.0 Introduction	5
1.1 Entry Requirement	5
<b>CHAPTER TWO</b>	
2.0 Registration	6
<b>CHAPTER THREE</b>	
3.0 Semester and Course Credit System	6
3.1 Core and Elective Courses	7
<b>CHAPTER FOUR</b>	
4.0 Instruction to Candidate During Examination	7
<b>CHAPTER FIVE</b>	
5.0 Examination Offences and Penalties	11
5.1 Expulsion	11
5.2 Rustication for a short Period	12
5.3 Written Warning	13
<b>CHAPTER SIX</b>	
6.0 Terms Frequently Used in the Tabulation of	

Results and their Definitions	13
<b>CHAPTER SEVEN</b>	
7.0 Probation and Withdrawal	16
<b>CHAPTER EIGHT</b>	
8.0 Academic Standing/Classification of Degree	16
8.1 Academic Standing	16
8.2 Classification of Degree	16
<b>CHAPTER NINE</b>	
9.0 ExtraCurricularActivities	18
<b>CHAPTER TEN</b>	
10.0 Course Structure	19
<b>CHAPTER ELEVEN</b>	
11.0 Details of the Content of Course Unit offered in B. Sc. Botany	26
<b>CHAPTER TWELVE</b>	
12.0 Details of the Content of Course Unit offered in B. Sc. Zoology	29
<b>CHAPTER THIRTEEN</b>	
13.0 Possible SIWES/Industrial Training Places and some job Specifications for Biological Sciences (Botany and Zoology) Students.	33

## **DEPARTMENT OF BIOLOGICAL SCIENCES**

**BAUCHI STATE UNIVERSITY, GADAU, NIGERIA**

### **VISION**

A model Department that is well- equipped and well-managed, contributing positively to the development of the faculty, University and society.

### **MISSION**

To produce students that are research oriented, self-reliant, can stand the test of time and also compete favourably with their counterparts elsewhere in the world and who can meet global demands in any field of the Biological Sciences.

#### **VALUES**

- Academic excellence through effective teaching and learning process.
- Qualified and dedicated staff
- Qualified, serious minded and hardworking students.
- A conducive and well equipped environment for teaching and learning.
- Cooperation among staff and students for enhanced teaching and learning.

### **DEGREES IN VIEW AND OBJECTIVES**

#### **a) B.Sc. Botany**

- To educate academically sound plant Biologists especially in the allied areas of plant ecology, Plant Physiology, Breeding, Anatomy and Pathology, aspects of Horticulture and Conservation of Plant Germplasm.
- To instill qualities of self-confidence and self reliance in prospective young Nigerian botanists.

#### **b) B.Sc Zoology**

- To prepare students to be researchers and academics of high quality in the area of animal biology, with emphasis in Systematics, and other specialized areas of Zoology e.g. Neuro-Endocrinology,

Entomology, Parasitology, Ichthyology and Aquaculture and Biodiversity/Wildlife Conservation.

- To instill qualities of self-confidence and self reliance in prospective young Nigerian zoologists.

### **BRIEF HISTORICAL BACKGROUND OF THE DEPARTMENT**

The Department of Biological Sciences was founded in 2011 at the inception of the University as one of the pioneer Departments. The programmes that make up the Department are Botany and Zoology.

From a modest beginning, the Department is growing tremendously both in number of Students and Staff.

At inception, the Department was under the headship of Dr. Aminu Bukar. Following the take off of the Department of Microbiology, Dr Ahmad J.

Nayaya was appointed as head of Department in August, 2012.

The Department has been working with other Departments within the University to enhance effective teaching and research.

## **GENERAL INFORMATION**

### **VISITORS AND THE GENERAL OFFICERS OF THE UNIVERSITY**

**Visitor:** Because Bauchi State University is a state university, its visitor is whoever the incumbent Governor of Bauchi State is. At present, it is in person of His Excellency, Alhaji Isa Yuguda (MatawallenBauchi), Executive Governor of Bauchi State, Nigeria.

***Chancellor:***

His Royal Highness,  
**Alhaji(Dr.) RilwanSulemanAdamu,**  
Emir of Bauchi.

***Pro- Chancellor:***

**Prof. AngoAbdullahi, CON**  
(MagajinRafinZazzau)

***Vice Chancellor:***

**Prof. EzzeldinMukhtarAbdulrahman**

***Registrar:***

**Alh. Mahmud Mohammed Usman**

## **MEMBERS OF THE UNIVERSITY GOVERNING COUNCIL**

The Council is the governing body responsible for the general management of the University. These are the members:

Pro- Chancellor and Chairman of the Council	Prof. Ango Abdullahi, CON Magajin Rafin Zazzau
Appointee of the State Executive Governor	Surveyor Ibrahim Sa'ad Jahun (Galadiman Bauchi)
Appointee of the State Executive Governor	Ambassador Umar Babaji (Wazirin Misau)
Appointee of the State Executive Governor	Prof. Gambo Laraba Abdullahi
Appointee of the State Executive Governor	Prof Sulayman Bogoro
Representative of the Ministry of Education (Directorate of Higher Education)	Mallam Ladan Sambo
Vice- Chancellor:	Prof. Ezzeldin Mukhtar Abdulrahman
Representatives of University Senate	Deans of Faculties
Registrar & Secretary to the Council	Alh. Mahmud ohammed Usman

## **THE UNIVERSITY MANAGEMENT AND ITS MEMBERS**

The Management is concerned with matters on both academic and administrative activities and assists the Vice- Chancellor on decisions that need not be channeled to the council as well as make recommendations to the Council.

The following is the list of its members:

Prof. Ezzeldin Mukhtar Abdulrahman, Vice- Chancellor      Chairman  
Alh. Usman Mahmoud, Registrar Member  
Alhaji Ayuba Mohammed Gital, Bursar Member

Dauda Adamu Bakum, Librarian	Member
Director Academic Planning	Member
All Deans of Faculties	Members
Dean Students Affairs	Member
Principal Assistant Registrar	Recorder

### **MEMBERS OF THE SENATE**

The senate is generally responsible for the academic affairs of the University. The members are: The Vice Chancellor, the University Librarian, Deans of Faculties / Students Affairs, Director of Academic Planning, all Professors holding established chairs, all Heads of Departments and the Director of Remedial Studies.



**DEANERY OF THE FACULTY OF SCIENCE**

**Dean:** Dr M.M. Kashimbila

**Deputy Dean:** Ali Haladu Gagman

**Sub Dean:**

**DEPARTMENTS IN THE FACULTY OF SCIENCES**

Department of Biochemistry  
Department of Biological Science  
Department of Chemistry  
Department of Mathematics  
Department of Microbiology

*Please note that any of the Officers listed here or elsewhere in this Handbook may change during your period of stay in this university. You must, therefore, endeavour to find out the correct names of incumbent Officers of the Department, Faculty and University.*

## **FOREWORD**

It is with great pleasure that I welcome you to the Department of Biological Sciences, Bauchi State University, Gadau. It is believed that you have great desire of becoming renowned natural scientists in the future, hence, your application application to this department. I congratulate you for making the right choice. The staff of the Department are truly committed to facilitating the attainment of your hearty desire.

I therefore urge you to work very hard to merit the award of our valuable degree at the end of your course. We implore you to take advantage of our well-designed standard curriculum, well equipped laboratories, Biological garden, well-experienced, qualified and dedicated staff and other facilities available within the Department and the University, so that our mission and vision will be accomplished.

You are encouraged to interact freely with the staff and consult your academic adviser on all issues relating to your programme of study in the Department. Please, take time to study this book carefully so that you can become conversant with the information therein.

I wish you good luck throughout your period of stay in the Department. Thank you.

**Dr. Ahmad J. Nayaya**  
**Head of Department**  
**April 2014**

## **DEPARTMENT OF BIOLOGICAL SCIENCES**

**BAUCHI STATE UNIVERSITY, GADAU, NIGERIA**

### **VISION**

A model Department that is well- equipped and well-managed, contributing positively to the development of the faculty, University and society.

### **MISSION**

To produce students that are research oriented, self-reliant, can stand the test of time and also compete favourably with their counterparts elsewhere in the world and who can meet global demands in any field of the Biological Sciences.

### **VALUES**

- Academic excellence through effective teaching and learning process.
- Qualified and dedicated staff
- Qualified, serious minded and hard working students.
- A conducive and well equipped environment for teaching and learning.
- Cooperation among staff and students for enhanced teaching and learning.

## **DEGREES IN VIEW AND OBJECTIVES**

### **a) B.Sc. Botany**

- To educate academically sound plant Biologists especially in the agro-allied areas of plant ecology, Plant Physiology, Breeding, Anatomy and Pathology, aspects of Horticulture and Conservation of Plant Germplasm.

- To instill qualities of self-confidence and self reliance in prospective young Nigerian botanists.

**b) B.Sc Zoology**

- To prepare students to be researchers and academics of high quality in the area of animal biology, with emphasis in Systematics, and other specialized areas of Zoology e.g. Neuro-Endocrinology, Entomology, Parasitology, Ichthyology and Aquaculture and Biodiversity/Wildlife Conservation.
- To instill qualities of self-confidence and self reliance in prospective young Nigerian zoologists.

**BRIEF HISTORICAL BACKGROUND OF THE DEPARTMENT**

The Department of Biological Sciences was founded in 2011 at the inception of the University as one of the pioneer Departments. The programmes that make up the Department are Botany and Zoology.

From a modest beginning, the Department is growing tremendously both in number of Students and Staff.

At inception, the Department was under the headship of Dr. Aminu Bukar. Following the take off of the Department of Microbiology, Dr Ahmad J. Nayaya was appointed as head of Department in August, 2012.

The Department has been working with other Departments within the University to enhance effective teaching and research.

## **GENERAL INFORMATION**

### **VISITORS AND THE GENERAL OFFICERS OF THE UNIVERSITY**

**Visitor:** Because bauchi state university is a state university, its visitor is whoever the incumbent Governor of Bauchi State is. At present, it is in person of His Excellency, Alhaji Isa Yuguda (MatawallenBauchi), Executive Governor of bauchi state, Nigeria.

**Chancellor:**

**Pro-Chancellor and chairman of the University Governing Council:**  
Professor Ango Abdullahi CON (Magajin Rafin Zazzau)

**Vice Chancellor:**Professor Ezzeldin Muktar Abdurahman

**Registrar:**Alhaji Usman Mahmud

**Bursar:**Alhaji Ayuba M. Gital

**Librarian:**Dauda Adamu Bakum

### **DEANERY OF THE FACULTY OF SCIENCE**

**Dean:** Dr M.M. Kashimbila

**Deputy Dean:** Ali Haladu Gagman

**Sub Dean:**

## **DEPARTMENTS IN THE FACULTY OF SCIENCES**

Department of Biochemistry  
Department of Biological Science  
Department of Chemistry  
Department of Mathematics  
Department of Microbiology

**Please note that any of the Officers listed here or elsewhere in this Handbook may change during your period of stay in this university. You must, therefore, endeavour to find out the correct names of incumbent Officers of the Department, Faculty and University.**

## **1.0 INTRODUCTION**

The Department of Biological Sciences welcomes you to its folds and congratulates you on your admission to this great and prestigious University. The Department is one of the five (5) Departments that make up the Faculty of Science. It was established in 2011 as one of the pioneer Departments of the Bauchi State University. The Departmental Staff and returning Students welcome and congratulate you, with the hope that you will make very good use of the resources (both human and material) and services available in the Department, to develop yourself morally and intellectually, so as to become a positively contributing member of the society

### **1.1 Entry Requirements**

For admission into any of the two degree programmes in the Department of Biological Sciences, a student must satisfy the minimum University and Faculty of Science requirements of an O-level credits in Biology and four other subjects (Chemistry, Physics, English and Mathematics) at the GCE -O level, SSCE or its equivalent. Students that have successfully completed Remedial Programmes approved by the University Senate and meet requirements are also eligible for admission.

For direct entry admission into 200 level of study, a prospective candidate must satisfy the requirements stated above and in addition possess two or more A-level papers (or its equivalent), which must include Biology and Chemistry.

## **2.0 REGISTRATION**

It is important to stress to students that they are not a bonafide students of this Department until they have duly registered both at the Faculty and Department levels and fully matriculated. The procedure for the registration exercise sequentially includes:-

1. Attendance of a screening interview where credentials are screened.
2. Filling of forms for payment of relevant fees including accommodation fees, as well as the faculty and Departmental course registration forms.
3. Registration for identity card (ID) in the University security office.
4. Registration as a user of the University Library.

The University's academic year comprises of two semesters. You are expected to register for the two semesters at the beginning of each session. It is also important to get proper advice with respect to the number and relevance of the courses to register for.

## **3.0 SEMESTER AND COURSE CREDIT SYSTEM**

As Academic year is divided into two semesters, you are expected to register for both smester during every year of your study. All courses, whether core or elective, departmental or non depratmental are registered in the department.

The course credit system is an American system in which courses are weighted according to credit units. In this Department, the credit unit of most courses range from 1 to 3 e.g. 1 Credit Unit, 2 Credit Unit and 3 Credit Unit.

In this system also, years of study are classified into levels. Thus, for a 4 year degree programme, there are four levels, namely 100, 200, 300 and 400 levels.



The system is run on a semester basis , with one Academic Year being equal to two semesters. Thus, a 4- year degree programme requires a minimum of 4X2 or 8 semesters.

### **3.1 Core and Elective Courses**

A core course is a course considered so important to the programme that it is compulsory or mandatory. If a student fails a core course at the end of the semester, such a failed course constitutes a ‘**Carry-Over**’, i.e., it is carried over to the corresponding semester of the next session. A student cannot graduate unless he/she has passed all core courses in the various levels of study. Core course may be prescribed from both within and outside the department or faculty.

An **Elective Course** is somewhat optional. It is selected to enhanced a student’s overall knowledge of the programme of study. Some elective courses are so important that students are very strongly advised to make them in their own interest.

### **4.0 INSTRUCTIONS TO CANDIDATES DURING EXAMINATIONS**

**(i)** Students are advised to be conversant with the rules and regulations governing the conduct of semester and national examinations. The Department shall spare no student caught either in the semester or continuous assessment examinations.

**(ii)** To qualify for admission into any of the semester examinations, a student must be duly registered for the course units to be examined and must have

fulfilled all the other University requirements including payment of prescribed fees. For a student to qualify to sit a final examination, he/she must satisfy 75% attendance in all lectures, tutorials, and practical classes pertaining to that course unit.

**(iii)** Final examinations are held at the end of each semester. The end-of-semester examination constitutes 60% of the total score for a course while continuous assessments (CA) in the form of tests, quizzes, practical work and other assignments account for 40% of the total score. Students are required to collect their examination cards from the academic office through the Dean's office, just prior to the commencement of the examinations. The card shall show the candidate's name, registration number, courses registered, instructions and procedure in the examination venue.

(iv) It shall be the responsibility of each candidate to make sure he/she is registered for the appropriate examination and should obtain an examination card, at least two weeks before the examination.

(v) It shall also be the duty of the candidate to consult the daily timetable to ascertain the papers to be written each day and to make himself/herself available at the appointment place and time.

(vi) A candidate shall be at the examination venue at least thirty (30) minutes before the advertised time of the examination.

(vii) A candidate is required to supply his/her own pens, pencil, rulers, erasers and any materials, which are permitted for the examination.

(viii) A candidate may be admitted up to thirty minutes after the start of an examination, but he/she shall not be allowed extra time.

(ix) If a candidate arrives later than thirty minutes after the start of the examination, then the chief invigilator may, at his/her discretion admit him/her if satisfied that the candidate had good reason for the lateness, provided no candidate for the same examination had left the examination venue before the time. The invigilator shall inform the Board of Examiners, which shall decide whether or not to accept the candidate's paper.

(x) A candidate is not allowed to write on the question paper, not even his/ her name.

(xi) A candidate may be permitted by the invigilator to leave the examination room during the course of an examination provided that:

(a) It is not before the first hour and the last fifteen minutes of the examination.

(b) The candidate has handed his/her script to the invigilator before leaving the examination venue.

(c) A candidate who leaves the examination room shall not be readmitted unless throughout the period of his absence he has been continually under the supervision of an invigilator or an examination attendant.

(xii) Each candidate shall complete an attendance slip, which shall be collected by the invigilator:

(xiii) No candidate shall communicate with any other candidate or make any noise or cause disturbance during an examination.

(xiv) No, book, paper, printed or written document or unauthorized aid may be taken into an examination room by any candidate, except as may be directed by the examiner and examination officer.

(xv) A candidate must not directly or indirectly give assistance to any other candidate to copy from or use his/her papers.

- (xvi) A candidate is required to deposit any handbag, cellular/mobile phones, jotters or any prohibited materials at the chief invigilator's desk, before the start of an examination.
- (xvii) If any candidate is found to be or is suspected of infringing on the provision of these regulations or in any way cheating or disturbing the conduct of the examination, the invigilator shall submit a report immediately on the prescribed form for examination irregularity misconduct.
- (xviii) A candidate shall write his/her examination number, in the spaces provided and on the cover of every answer book and every separate sheet of paper used during the examination. No request for extra sheets will be entertained unless his/her paper is confirmed to be exhausted.
- (xix) The use of scrap paper is not permitted. All rough work must be done in the answer book and crossed neatly through, or in supplementary answer books, which must be submitted to the invigilator.
- (xx) Except for the printed question paper, a candidate may not remove from the examination room or mutilate any paper or other materials supplied.
- (xxi) Smoking, drinking, chewing and eating in the examination hall is strictly prohibited.
- (xxii) Calculators are not allowed except where their use is authorized and specified by the examiner.
- (xxiii) A candidate is not allowed to enter an examination venue with any inscription on any part of the body e.g. palm, arm, thigh e.t.c, if such inscriptions bear any relevance to the examination.
- (xxiv) Candidates shall not use other people to sit for any University examination on their behalf.

(xxv) Candidates wishing to do some revision before the commencement of examinations shall do so outside the examination venue.

(xxvi) Silence shall be observed in the examination venue. The only permissible way of attracting the attention of the invigilator is by a show of the hand.

(xxvii) At the end of the time allocated, each candidate shall stop writing when instructed to do so and shall gather his/her scripts together in order for collection by the invigilator.

(xxviii) Students shall remain seated while invigilators go from row to row to collect answer scripts.

(xxix) Failure to observe any of the rules above, shall prime facie constitute examination misconduct.

## **5.0 EXAMINATION OFFENCES AND PENALTIES**

### **5.1 Expulsion**

The following offences shall carry the punishment of expulsion

- Impersonation at examinations. This may involve the change of examination numbers or names or answer sheets or the intentional use of someone else's examination number.
- Introduction of relevant foreign materials and cheat notes into the examination hall.
- Exchange of relevant materials in the examination hall which may involve :

- ◇ The exchange of question papers containing materials, collaborating/copying from each other and exchange of answer scripts.
- Theft/removal of examinations scripts or materials.
- Mischief by fire to examination scripts or materials.
- Copying from cheat notes.
- Consulting cheat notes.
- Facilitating/abetting cheating.
- Failure/refusal by a student to appear before the examination regulations and irregularities committee (ERIC), the second time, after there is evidence that he/she received the letter of invitation.

## **5.2 Rustication for a short period**

The following offences shall carry the punishment of rustication for one session.

- Non-submission or incomplete submission of answer scripts.
- Introduction of foreign materials to the examinations hall.
- A student who has been rusticated for one academic semester if he/she is found guilty of repeating an offence for which the punishment is warning
- Non- appearance at the Senate Committee (i.e. ERIC) if there is evidence of invitation

### 5.3 Written warning

The following offences shall attract a written warning:

- Speaking/conversation during examination.
- Writing on question papers or scraps of paper.

### 6.0 TERMS FREQUENTLY USED IN THE TABULATION OF RESULT AND THEIR DEFINATION:

Several terms are used in an examination result chart. The most outstanding are the following :

#### (i) Grade Point (GP)

This is a point system corresponding from the F to A classification of scores, as shown in time below

Earned marks (%)	Letter grade	Rating	Grade point
0- 39	F	Fail	0
40- 44	E	Pass	1
45- 49	D	Fair	2
50- 59	C	Good	3
60- 69	B	Very good	4
70- 100	A	Excellent	5

#### (II) Weighted Grade Point (WGP)

This is the product of the Grde point and the nember of Credit Units carried by a course i.e.,

- $WGP = GP \times \text{Credit Unit of the course}$

#### (III) Grade Point Average (GPA)

This is the total WPG from all the courses offered by the total credit Unit registred by a student in a given semester i.e.,

- $GPA = \frac{\text{total WPG scored in a semester}}{\text{Total credit unit registered in that semester}}$

**(iv) Cumulative Grade Point Average (CGPA)**

This is the total WPG from all the semesters of the study so far, divided by total credit unit registered so far, i.e.,

- $CGPA = \frac{\text{Total WPG scored so far}}{\text{Total credit units registered so far}}$ .

At any stage in a student's programme, the CGPA is a measure of the student's current academic standing.

**(iii) Registered Credit Units (RCU)**

This is the sum of the credit units of the various courses registered by the student during a semester.

**(iv) Credit Units Earned (CUE)**

This is the sum of the credit units of all the courses passed by the student during a semester examinations.

**(v) Total Registered Credit Units (TRCU)**

This is the sum of credit units of all the courses registered by the student from the first year of study to the particular semester under consideration.

**(vi) Total Credit Units Earned (TUCE)**

This is the sum of the credit units of all courses passed by the student from the first year of study to the particular semester under consideration.

**6.1 Calculation of GPA and CGPA**

Consider the following hypothetical scores obtained by a 100 level student of the Department during his/her first semester of study.



<b>Courses</b>	<b>Credit Units</b>	<b>Scores</b>	<b>Letter Grade</b>	<b>Grade Point</b>	<b>Weight Grade Point</b>
BIO 1201	2	50	C	3	6
BIO 1203	2	60	B	4	8
GSP1201	2	47	D	2	4
MTH1301	2	70	A	5	10
CHM 1201	2	63	B	4	8
PHY1105	1	59	C	3	3
CHM1203	2	65	B	4	8
PHY1201	2	40	E	1	2
CSC 1210	2	38	F	0	0
GEOG 103	2	56	C	3	6
	19				55

The GPA is calculated thus:

GPA =  $(6+8+4+10+8+2+0+6)/19$ ; i.e.  $55/19 = 2.89$  because this is the students first semester of study, his/her GPA will be the same as the CGPA.

Assume that this particular candidate registered 18 credit units in the second semester, and earned (passed) 14 credit units with a WAP total of 42, then the GPA for the second semester is calculated thus:

$$\text{GPA (2}^{\text{nd}} \text{ semester)} = (42/18) = 2.33$$

The CGPA is calculated thus:

$$\text{CGPA} = (55 + 42)/(19 + 18) = 2.62$$

Also note the following for this candidate

RCU (1 <sup>st</sup> semester)	= 19
CUE (1 <sup>ST</sup> semester)	= 17
RCU (2 <sup>nd</sup> semester)	= 18
CUE (2 <sup>nd</sup> semester)	= 14

TRCU at end of the 2<sup>nd</sup> semester = 19 + 18 = 37

TCUE at end of the 2<sup>nd</sup> semester = 17 + 14 = 31

## **7.0 PROBATION AND WITHDRAWAL**

### **(i) Probation**

A student is on probation if his/her CGPA drops below 1.00, which is the minimum tolerable level for the first time.

### **(ii) Withdrawal**

A student is placed on withdrawal if his/her CGPA remains below 1.00, the minimum tolerate level for two consecutive semesters.

## **8.0 ACADEMIC STANDING / CLASSIFICATION OF DEGREE**

### **8.1 Academic Standing**

A student in this Department is said to be acceptable or good academic standing if his/her CGPA is 1.00 or higher. However, to be allowed to proceed to the next level of study, a student must earn a minimum of 24 credit units per session (2 semesters). For example, a student who has spent three or more academic sessions in the Department, but earned only 70 credit units can not be allowed to proceed to the 400-level; such a student is still, in effect, a 300 level student. This is however distinct from the minimum of 30 credit units per session which student must maintain in order to graduate within the minimum prescribed period for course programmes in the Department. The following tables therefore apply to students who enter the University at the 100 and 200 levels respectively.

For a student admitted at the 100-level

Level of study	Minimum of credits to advance to the next level	Number of years allowed for the programme	
		Minimum	Maximum
100 of study	36 credit units	Fours (4) years	six (6) years
200 level	72 credit units		
300 level	108 credits units		
400 level	Minimum of 144 credit units required to graduate		

For a student admitted at the 200-level

Level of study	Minimum number of credits to advance to the next level.	Number of years allowed for the programme	
		Minimum	Maximum
200 level	36 credit units	Three (3) Years	five (5) years
300 level	72 credits units		
400 level	Minimum of 108 credits required to graduate		

## 8.2 Classification of degrees w.r.t. CGPA

Classification of degrees is based on the cumulative grade point average (CGPA) at the point of graduating as shown in the table below.

CGPA	Class of degree
4.50 ó 5. 00	First class
3.50 ó 4. 49	Second class (upper division)
2. 40 ó 3. 49	Second class (lower division)
1. 50 ó 2. 39	Third class
1.00 ó 1.49	Pass
Below 1.0	Fail

## **9.0 EXTRA CURRICULAR ACTIVITIES**

The University has made available a good number of sporting facilities ranging from football, lawn and table tennis, volley ball, basket ball, badminton etc, close to the shopping complex for students relaxation.

Also close to the main Library is a mini Zoo.

## 10.0 COURSE STRUCTURE

### B. Sc. botany

#### Level I

##### First Semester

Course Code	Title	Credits
GSP 1201	Study Skills	2
BIO 1201	General Biology I	2
BIO 1203	General Biology III	2
CHM 1201	Inorganic Chemistry	2
CHM 1203	Organic Chemistry	2
MTH 1301	Elementary Mathematics I	3
PHY 1105	Physics Practical I	1
PHY 1201	Mechanics	2
PHY 1203	Electricity and Magnetism	2
	<b>Total</b>	<b>18</b>

##### Second Semester

Course Code	Title	Credits
BIO 1202	General Biology II	2
BIO 1204	General Biology IV	2
CHM 1202	Physical Chemistry	2
CHM 1204	Practical Chemistry	2
MTH 1304	Elementary Mathematics IV	3
PHY 1202	Behaviour of Matter	2
PHY 1104	Physics Practical II	1
GSP1202	Use of Library and Computer appreciation	2
	<b>Total</b>	<b>16</b>

**LEVEL 200**  
**First Semester**

<b>Course Code</b>	<b>Title</b>	<b>Credits</b>
BIO 2201	Genetics I	2
BIO 2203	Introductory Ecology	2
BIO 2205	General Physiology	2
BCH 2301	General Biochemistry I	3
CHM 2201	Organic Chemistry I	2
MCB 2207	General Microbiology I	2
GSP 2201	Foundation of Nigerian Culture	2
GSP 2203	Nigerian Government and Economy	2
GSP 2401	Use of English (DE Students only)	2
CSC 2201	Introductory Computer	2
	<b>Total</b>	<b>21</b>

**Second Semester**

<b>Course Code</b>	<b>Title</b>	<b>Credits</b>
BIO 2208	Biological Techniques	2
BIO 2204	Cell Biology	2
BIO 2206	Biostatistics	2
BIO 2302	Genetics II	3
BOT 2210	Seedless Plants	2
BOT 2212	Seed Plants	2
ZOO 2314	Invertebrate	3
CHM 2210	Inorganic Chemistry	2
GSP 2202	Peace and Conflict Resolution	2
	<b>Total</b>	<b>20</b>

**Electives**

<b>Course Code</b>	<b>Title</b>
BCH 2302/2214	General Biochemistry II
MCB 2212	General Microbiology II
BIO 2216	Molecular Biology

**LEVEL 300**  
**First Semester**

<b>Course Code</b>	<b>Title</b>	<b>Credits</b>
BOT 3102	Field Course I	1
BIO 3309	Introductory Nematology	3
BOT 3205	Plant Taxonomy	2
BOT 3307	Comparative Anatomy of Plants	3
BOT 3309	Plant Physiology	3
BOT 3311	Plant Ecology	3
BOT 3313	Mycology	3
BOT 3315	Phycology	2
ZOO 3317	Basic Entomology	3
	<b>Total</b>	<b>23</b>

**Elective**

<b>Course Code</b>	<b>Title</b>	<b>Credits</b>
ZOO 3319	Protozoology	3

**Second Semester**

<b>Course Code</b>	<b>Title</b>	<b>Credit</b>
BOT 3699	SIWES	6

**LEVEL 400**  
**First Semester**

<b>Course Code</b>	<b>Title</b>	<b>Credits</b>
BOT 4201	Review Essay	2
BOT 4213	Field Course II	2
BIO 4301	Population Genetics	3
BIO 4305	Cytogenetics	3
BIO 4307	Hydrobiology	3
BOT 4209	Economic Botany	2
BOT 4203	Nigerian Vegetation	2
ZOO 4211	Applied Entomology	2
	<b>Total</b>	<b>19</b>

**Second Semester**

<b>Course Code</b>	<b>Title</b>	<b>Credits</b>
BIO 4312	Soil Ecology	3
BOT 4208	Plant Reproduction	2
BOT 4306	Plant Pathology	3
BOT 4699	Research Project	6
	<b>Total</b>	<b>14</b>



## **B. Sc. Zoology**

### **Level 100**

#### **First Semester**

<b>Course Code</b>	<b>Title</b>	<b>Credits</b>
GSP 1201	Study Skills	2
BIO 1201	General Biology I	2
BIO 1203	General Biology III	2
CHM 1201	Inorganic Chemistry	2
CHM 1203	Organic Chemistry	2
MTH 1301	Elementary Mathematics I	3
PHY 1105	Physics Practical I	1
PHY 1201	Mechanics	2
PHY 1203	Electricity and Magnetism	2
	<b>Total</b>	<b>18</b>

#### **Second Semester**

<b>Course Code</b>	<b>Title</b>	<b>Credits</b>
BIO 1202	General Biology II	2
BIO 1204	General Biology IV	2
CHM 1202	Physical Chemistry	2
CHM 1204	Practical Chemistry	2
MTH 1304	Elementary Mathematics IV	3
PHY 1202	Behaviour of Matter	2
PHY 1104	Physics Practical II	1
GSP1202	Use of Library and Computer appreciation	2
	<b>Total</b>	<b>16</b>

**LEVEL 200**  
**First Semester**

<b>Course Code</b>	<b>Title</b>	<b>Credits</b>
BIO 2201	Genetics I	2
BIO 2203	Introductory Ecology	2
BIO 2205	General Physiology	2
BCH 2301	General Biochemistry I	3
CHM 2201	Organic Chemistry I	2
MCB 2207	General Microbiology I	2
GSP 2201	Foundation of Nigerian Culture	2
GSP 2203	Nigerian Government and Economy	2
GSP 2401	Use of English (DE Students only)	2
CSC 2201	Introductory Computer	2
	<b>Total</b>	<b>8</b>

**Second Semester**

<b>Course Code</b>	<b>Title</b>	<b>Credits</b>
BIO 2208	Biological Techniques	2
BIO 2204	Cell Biology	2
BIO 2206	Biostatistics	2
BIO 2302	Genetics II	3
ZOO 2314	Invertebrate	3
CHM 2210	Inorganic Chemistry	2
MCB 2212	General Microbiology II	2
GSP 2202	Peace and Conflict Resolution	2
ZOO 2212	Chordata	2
	<b>Total</b>	<b>16</b>

**Electives**

<b>Course Code</b>	<b>Title</b>
BOT 2210	Seedless Plants
BIO 2216	Molecular Biology

**LEVEL 300**  
**First Semester**

Course Code	Title	Credits
ZOO 3102	Field Course I	1
BIO 3205	Biosystematics	2
BIO 3303	Introductory Nematology	3
MCB 3313	Pathogenic Bacteriology	3
ZOO 3319	Protozoology	3
ZOO 3307	Comparative Anatomy	3
ZOO 3311	Animal Physiology	3
ZOO 3317	Basic Entomology	3
ZOO 3313	Animal Ecology	3
<b>Total</b>		<b>24</b>

**Second Semester**

Course Code	Title	Credits
ZOO 3699	SIWES	6

**LEVEL 400**  
**First Semester**

Course Code	Title	Credits
ZOO 4213	Field Course II	2
BIO 4305	Embryology	3
BIO 4307	Hydrobiology	3
ZOO 4201	Review Essay	2
ZOO 42011	Applied Entomology	2
ZOO 4305	Nigerian Animals	3
ZOO 4313	Parasitology	3
ZOO 4315	Wildlife Ecology & Conservation	3
<b>Total</b>		<b>21</b>

**Elective**

Course Code	Title
BIO 4205	Animal Behaviour

**Second Semester**

Course Code	Title	Credits
BIO 4308	Fisheries and Aquaculture	3

BIO 4314	Soil Ecology	3
ZOO 4699	Research Project	6
<b>Total</b>		<b>12</b>

## **11.0 DETAILS OF THE CONTENT OF COURSE UNITS OFFERED IN B. Sc. BOTANY**

### **LEVEL 100**

#### **BIO 1201 General Biology I**

Zoology as a discipline, characteristics of animals as living things; cell as the basic unit of living things (animals); cell structure, organization, cellular organelles, tissues, organs and systems. Classification of animals, general reproduction and concepts of inter-relationships in animals. Heredity and evolution. Animal ecology (definition) and habitats.

#### **BIO 1202 General Biology II**

General survey of the animal kingdom; similarities and differences in external morphology in Protozoa, Platyhelminthes, Annelids, Arthropods, Fishes, Amphibians, Reptiles, Birds and Mammals. Division of animal taxa in the animal kingdom.

#### **BIO 1203 General Biology III**

Same as BIO 1201 but with emphasis on plants.

#### **BIO 1204 General Biology IV**

Same as BIO 1202 but with emphasis on the Plant Kingdom, Bacteria, Viruses, Algae, Fungi, Bryophyte, Pteridophytes, Gymnosperms and Angiosperms.

### **LEVEL II**

#### **BOT 2210 Seedless Plants**

Morphology and reproduction of Algae, fungi, Bryophytes and pteridophytes, including fossils.

#### **BOT 2212 Seed Plants**

Morphology and reproduction of seed plants.

### **LEVEL III**

**BOT 3305 Plant Taxonomy**

Taxonomy and its significance. Principles and concepts in plant taxonomy. Construction and use of taxonomic keys. Experimental taxonomy with special emphasis on cyto-taxonomy with emphasis on chemotaxonomy. Morphological study of selected plant families.

**BOT 3307 Comparative Anatomy of Plants**

Characteristics and classification of tissues and tissue systems; organization of meristems, evolution of vascular tissues; comparative anatomical adaptations to specialized habitats. Applied aspects of plant anatomy.

**BOT 3309 Plant Physiology**

Plant-water relationships, photosynthesis, respiration, growth and growth regulation; flowering, dormancy, seed germination, senescence. Physiological aspects of crop yield.

**BOT 3311 Plant Ecology**

Study of various plant communities and their ecological framework; Nigerian vegetation; deserts and semi-deserts; plant productivity; modern concepts in ecology.

**BOT 3313 Mycology**

Structure, life cycles, physiology and classification of fungi. Fungi of economic importance.

**BOT 3315 Phycology**

Classification of Algae. Structure, reproduction and life histories of representative types of the following divisions; bacillariophyta, chlorophyta, cyanophyta, euglenophyta, pyrrophyta and rhodophyta; ecology of freshwater, brackish water, marine and terrestrial algae.

**BOT 3699 Students' Industrial Work Experience Scheme (SIWES)**

Industrial/Field experience in any of the following:

- a) Afforestation
- b) Applied Plant Anatomy
- c) Aquatic and Pollution Biology
- d) Horticulture
- e) Biotechnology

**LEVEL 400**

**BOT 4201 Review Essay-** Collection of literature on contemporary issues in Plant Science from various sources and organisation of same in form of a scientific report.

**BOT 4213 Field Course II-** Collection of literature on contemporary issues in Plant Science from various sources and organisation of same in form of a scientific report.

**BOT 4209 Economic Botany**

A study of the botany and cultivation of plant species with particular reference to Nigerian economic plants.

**BOT 4203 Nigerian Vegetation**

A study of Nigerian forests, Savannah grasslands and arid zones.

**BOT 4208 Plant Reproduction**

Development and trends in sexual and asexual reproduction; natural and artificial methods of vegetative propagation; sexual and asexual reproduction and their significance; special modes of reproduction.

**BOT 4306 Plant Pathology**

Pre-requisite: BOT 3305

Principles and concepts in plant pathology. The concepts of disease, infection, pathogenesis, host-pathogen relationship and the theory of biological and chemotherapy.

**BOT 4699 Research Project**

A short supervised research project on a topic relevant to the area of Plant biology and the findings to be presented at a seminar and reports submitted for assessment.

## **12.0 DETAILS OF THE CONTENT OF COURSE UNITS OFFERED IN B. Sc. ZOOLOGY**

### **B. SC. ZOOLOGY**

#### **LEVEL 100**

##### **BIO 1201 General Biology I**

Zoology as a discipline, characteristics of animals as living things; cell as the basic unit of living things (animals); cell structure, organization, cellular organelles, tissues, organs and systems. Classification of animals, general reproduction and concepts of inter-relationships in animals. Heredity and evolution. Animal ecology (definition) and habitats.

##### **BIO 1202 General Biology II**

General survey of the animal kingdom; similarities and differences in external morphology in Protozoa, Platyhelminthes, Annelids, Arthropods, Fishes, Amphibians, Reptiles, Birds and Mammals. Division of animal taxa in the animal kingdom.

##### **BIO 1203 General Biology III**

Same as BIO 1201 but with emphasis on plants.

##### **BIO 1204 General Biology IV**

Same as BIO 1202 but with emphasis on the Plant Kingdom, Bacteria, Viruses, Algae, Fungi, Bryophyte, Pteridophytes, Gymnosperms and Angiosperms.

#### **LEVEL 200**

##### **ZOO 2212 Chordata**

Functional biology of all vertebrate phyla, including the structure and functions of their organ system. Bionomics, evolution and adaptive radiation, Zoogeography.

##### **ZOO 2314 Invertebrata**

A survey of all the invertebrate phyla.

### **LEVEL 300**

#### **ZOO 3319 Protozoology**

Classification and evolutionary relationships of the protozoa. Macro and micro structure of protozoa. The role of protozoa in ecosystems. The ecology of protozoa, their physiology and biochemistry. Life histories of protozoa of medical and veterinary importance, with emphasis on tropical species; the pathology; epidemiology and control of protozoan infections.

#### **ZOO 3311 Animal Physiology**

The principles of physiological adaptation and homeostasis. Metabolism measurement and rates; thermal relations of animals. Vertebrate digestive systems: Ruminant digestion. Respiratory systems of fish, amphibia, reptilia, birds and mammals. Comparison of respiration in water and in air. Air and water breathing vertebrates. Respiratory pigments, right and left shift of Oxygen Dissociation Curve. Respiratory and circulatory changes in high altitude vertebrates and diving mammals. Osmo-regulation and excretion; evolution of vertebrate kidney. The vertebrate nervous system; membrane potential; action potentials. Muscle structure and physiology. Vertebrate endocrinology. Outline and comparison and nervous system.

#### **ZOO 3317 Basic Entomology**

Insect evolution, classification and distribution. Organization of external structure. Ingestion, digestion, excretion, blood circulation and nervous system. Behaviour and ecology of social insects.

#### **ZOO 3313 Animal Ecology**

The ecology of local terrestrial and aquatic animals; growth rate and age structure of animal populations, natality and mortality, survivorship curves. Life tables and K-factor analysis. Competition. The natural regulation of animals numbers. Population cycles. The dynamics of predator prey systems. The ecology of African mammals. Behavioural ecology.

#### **ZOO 3699 Students' Industrial Work Experience Scheme (SIWES)**

Industrial/Field Experience in any one of the following:

- a) Fisheries
- b) Wildlife Management
- c) Biology of Aquatic Environment
- d) Pest Control



e) Animal and Public Health

**LEVEL 400**

**ZOO 4201 Review Essay-** Collection of literature on contemporary issues in Applied Zoology from various sources and organisation of same in form of a scientific report.

**ZOO 4213 Field Course II-** Collection of literature on contemporary issues in Applied Biology from various sources and organisation of same in form of a scientific report.

**ZOO 4211 Applied Entomology**

Classification of economically important insects. Biology and ecology of insects of agricultural and medical importance. Control of insecticide usage and application in Nigeria. Alternatives to insecticides. Introduction to pest management. Short course on the application of entomological study to the solution of a major pest problem in Nigeria.

**ZOO 4305 Nigerian Animals**

General survey of local molluscs, arthropods and vertebrates.

**ZOO 4313 Parasitology**

Principles of parasitology and Zoo-economic effects. Introduction to parasitism: history and evolution of parasitism; types of parasitism, host-parasite relationships. Parasitic protozoa, trematodes, cestodes, nematodes, acanthocephalans, leeches and arthropods.

**ZOO 4315 Wildlife Ecology and Conservation**

Dynamics of wildlife population. Techniques of wildlife investigations. Principles of wildlife management. The wildlife resources of Nigeria: conservation policies, problems and prospects. World wildlife resources, differences in values, management philosophies and traditions.

**BIO 4308 Fisheries and Aquaculture**

Review of the fish fauna of West Africa with special reference to Nigeria. Methods used in fisheries: sampling, examination and tagging. Age and growth, determining growth from otoliths, opercula and other bones; determining growth from length-height relationships, back calculation,

production and productivity; estimation of population numbers, biomass and mortality; food analysis; assessment and management of fisheries, fish farming: principles and practice; farm design and construction, fish farm management; elements of fish nutrition; diseases and breeding, overview of aquaculture in global food security.

**BIO 4314 Soil Ecology**

Classification and characterization of soils. Chemical components and analysis of soils and plant tissue. Plant, soil and water relationships. Physical and chemical properties of soil. Detritus organisms. Cycling of mineral and nutrient pool.

**ZOO 4699 Research Project**

A short supervised research project on a topic relevant to the area of Animal biology and the findings to be presented at a seminar and reports submitted for assessment.

### **13.0 POSSIBLE SIWES/INDUSTRIAL TRAINING PLACES AND SOME JOB SPECIFICATIONS FOR BIOLOGICAL SCIENCES (BOTANY AND ZOOLOGY) STUDENTS**

1. Zoology, Ecology, Biology options:
  - (a) *Ministry of Agriculture/Livestock /Animal Health Units*
    - ◇ Animal health and husbandry
    - ◇ Fisheries department
    - ◇ Poultry
    - ◇ Veterinary
    - ◇ Pest control unit
    - ◇ Range management
  - (b) *National/Wild life parks*
    - Diversity of Animal species
    - Wildlife management
    - Animal behavior
    - Diversity of Animal Parasites
    - Ecosystem, Ecology and Flora/Fauna
  - (c) *Ministry of Health*
    - ◇ Disease prevention and control unit
    - ◇ Public health unit
    - ◇ Disease surveillance and statistics unit
  - (d) *Hospitals/Clinics/Diagnostics laboratories*
    - ◇ Heamatology
    - ◇ Parasitology
    - ◇ Microbiology
    - ◇ Immunology
  - (e) *Ministries of Environment and Water Resources*
    - ◇ Sanitation department
    - ◇ Public health department
    - ◇ Dams and River Basins (Fisheries unit)
  - (f) *Research Institutes*
    - ◇ National Agricultural Production Research Institute (NAPRI), Zaria
    - ◇ National Veterinary Research Institute (NVRI), Vom
    - ◇ Other Research Institutes and Disease Control Units e.g. Roll-Back malaria, Onchocerciasis, Guinea Worm etc.

2. Botany, Ecology, Biology options:
  - (a) *Ministry Agriculture/Conservation*
    - ◇ Forestry division
    - ◇ Nursery/Seedlings unit
    - ◇ Crop yield and turnover unit
  - (b) *Research Institutes*
    - ◇ National Root Crops Research Institute (NRCRI)
    - ◇ International Institute of Tropical Agriculture (IITA)
    - ◇ Forestry Research Institute (FRI)
    - ◇ Cereals Research Institute, Minna
    - ◇ Institute of Agricultural Research (IAR), Zaria
    - ◇ Cocoa Research Institute
    - ◇ Lake Chad Research Institute
  - (c) *National Parks (Wildlife Parks)*
    - ◇ Diversity of Plant Species
    - ◇ Natural Vegetation
    - ◇ Ecosystem, Ecology and Flora/Fauna
  - (d) *Companies*
    - ◇ Nigeria Tobacco Company (NTC)
    - ◇ Highland Tea, Mambila
    - ◇ Dams and River Basins

Zoology, Biology, Ecology

**1. Ministry of Agriculture**

- (a) *Animal health and husbandry unit*
  - ◇ Milk and beef production
  - ◇ Management practices
  - ◇ Animal nutrition
  - ◇ Animal diseases, prevention and control
- (b) *Fisheries department*
  - ◇ Aquaculture and fish culture techniques (e.g. mono or polyculture)
  - ◇ Pond construction and management
  - ◇ Feed formulation/compoundment, food and feeding habit of fishes

- ◇ Fish breeding, fecundity, induced breeding, hybridization techniques
- ◇ Fishing gears and techniques/impounding devices
- ◇ Physio-chemical analysis of pond water/water analysis
- ◇ Dispersal and marketing
- ◇ Major fish processing techniques
- ◇ Age and growth determination
- (c) *Poultry department*
  - ◇ Poultry farming and management
  - ◇ Poultry diseases, prevention and control
  - ◇ Feed formulation/compoundment
  - ◇ Poultry nutrition
  - ◇ Poultry compoundment/fish farming
- (d) *Veterinary department*
  - ◇ Meat inspection
  - ◇ Diseases of public health importance/parasitic zoonotic diseases
  - ◇ Diagnosis of such diseases of veterinary and public health significance, prevention and control
  - ◇ Common ethno-veterinary practices
  - ◇ Trypanosomiasis and tick control programmes
  - ◇ Identification and control of common animal and plant pests
  - ◇ Pest/vector control measures
  - ◇ Storage facilities/methods of cereals

## **2. National parks**

- ◇ Diversity of animal species in the park/provide a checklist of animal species in the park
- ◇ List of endemic and endangered species for which the park is being considered
- ◇ Threats to conservation
- ◇ Management strategy employed to cope with threats
- ◇ Game/habitat management
- ◇ Game viewing techniques
- ◇ Touristic potentials of the park
- ◇ Anti-predatory devices of the park
- ◇ Prey ó predator relations

### 3. Ministry of Health

- ◇ Preventive unit/Disease control unit/public health unit
- ◇ Prevention and control of diseases of public health importance such as Onchocerciasis, Schistosomiasis, Filariasis, Trypanosomiasis etc.
- ◇ Public enlightenment/health education
- ◇ Epidemiology of some diseases of public health significance
- ◇ Food and water borne diseases, communicable diseases

### 4. Hospitals

#### (a) *Parasitology laboratory*

- ◇ Preparation and examination of slides
- ◇ Flotation/sedimentation techniques/oocyst or egg count
- ◇ Diagnosis of common protozoan/parasitic infections such as malaria, helminthiasis etc.
- ◇ Life cycle of plasmodium falciparum

#### (b) *Haematology laboratory*

- ◇ Blood collection techniques
- ◇ Preparation of thin smears/wet mounts
- ◇ White blood cells/red blood cell counts
- ◇ PCV determination/Hb determination
- ◇ Donation and preservation of blood

#### (c) *Microbiology laboratory*

- ◇ Culture techniques
- ◇ Sterilization techniques
- ◇ Staining techniques
- ◇ Fixation techniques
- ◇ Slide preparation
- ◇ Microscopy
- ◇ Paper chromatography/electrophoresis and other related techniques

### 5. Ministry of Works and Environment

#### (a) *Sanitation Department*

- ◇ Proper sanitary practices/measures
- ◇ Proper waste disposal/management

- ◇ Water, land and air pollution, areas of pollution, sources of pollutants
- ◇ Control of water, land and air pollution
- ◇ Drainage systems, control of erosion and flood
- ◇ Public enlightenment/health education
- 6. Dams** e.g. Dadin Kowa dam, Gubi dam, Kainji Dam etc
  - ◇ Fishing activities
  - ◇ Trapping gears, impounding devices e.g. nets, traps, hooks etc
  - ◇ Fishing diversity
  - ◇ Marketing
  - ◇ Identification of water-related birds and other fauna within the dam environment
  - ◇ Environmental impact assessment of the dam area

## **7. Research Institutes**

### (a) *NAPRI – Shika, Zaria*

- ◇ Breeding systems of the animals
- ◇ Feed formulation/compoundment, animal nutrition
- ◇ Artificial insemination, breeding, reproductive cycles
- ◇ Diseases of animals, diseases management, prevention and control
- ◇ Cattle, pig, poultry and rabbit farming
- ◇ Hatching/incubation techniques

### (b) *NVRI – Vom*

#### Parasitology laboratory

- ◇ Flotation/sedimentation techniques/oocyst or egg counts
- ◇ Diagnosis of various parasitic infections
- ◇ Life cycles of some parasites
- ◇ Staining/fixation techniques
- ◇ Preparation of permanent slides, thin blood smears and wet mounts

#### Heamatology laboratory

- ◇ Blood groups/genotype determination
- ◇ Blood parasites (diagnosis and identification)
- ◇ Blood collection techniques
- ◇ Determination of PCV and Hb level

- ◇ Immunology of parasites

Virology laboratory

- ◇ Diagnosis and identification of viral infections
- ◇ Prevention and control of viral infections
- ◇ Immunology of viral infections
- ◇ Anatomy and classification of viruses and their distribution
- ◇ Bacteriophage, animal and plant viruses
- ◇ Characteristics of viruses
- ◇ Cultivation of viruses
- ◇ Pathogenic viruses of man and animals and their diseases e.g. Avian Influenza Virus (Bird flu)
- ◇ Techniques in virology
- ◇ Economic importance of viruses
- ◇ Vaccine production

BIOLOGY/ZOOLOGY/BOTANY

S/N	ESTABLISHMENT	AREAS OF SPECIALISATION
1.	Nigerian Institute of Marine and oceanography badagry Lagos	Biology ó fisheries, marine ecology
2.	Nigerian Maritime Authority Abuja	Biology ó Agrometreology, Biogeography
3.	Yankari game reserve	Biology of conservation and Management of Natural Resources.
4.	Gashaka gimiti National park Taraba State	Baboon behaviour studies Biology, wild life and Game management transects.
5.	Nigerian Montane Forest project Ngel Nyaki Manbila Taraba State.	Biology, ecology, phonology, animal behaviour.
6.	Nigerian conservation, Museum and Monument Jos, Plateau State	Conservation and Management of Biological Akais and monuments.



- |     |  |   |
|-----|--|---|
| 7.  | Lake Kainji research Institute new Bussa Niger State                                     | Biology of Fresh water ecology, limnology and hydrobiology.                         |
| 8.  | River Basin Development authority, e.g. Hadejia- Jamaare RBDA.                           | Biology/Agricultural biology.   |
| 9.  | Wild life parks e.g. Miyango road, Jos, Sumu Wildlife Park K/Madaki etc                  | Biology game Management.  |
| 10  | National Veterinary Research Institute e.g. NVRI Vom                                     | Biology, Ecology, Epidemiology and Laboratory Technical husbandry                   |
| 11. | National Agency for Food/Drug  | Biology, Quality administrative and control assurance for food and water and drugs. |
| 12. | National Root Crop Research Institute Kuru, near Vom Jos                                 | Plant breeding Biology of wild plants.  |
| 13. | Lake Chad Research Institutes like Lake Chad Borno State.                                | Fishery, Fish Processing and Preservation,  |
| 14. | Confectioneries company like NASCO, Biscuits company Yakubu Gowon Way Anglo Jos, Plateau | Biology of Food processing, preservation.   |
| 15. | Environmental Protection agency (EPA) e.g. BASEPA  | Biology, Pollution environmental degradation reclamation and Management.            |

- |     |  |  |
|-----|--|--|
| 16. | Sugr companies like Savanna Sugar Company Numan Adamawa State                  | Biology-Biotechnology, Molasses and sugar Synthesis.                               |
| 17. | Ministry of Water Resources  | Fresh water biology, water quality analysis water treatment reservoir impoundment. |
| 18. | Leather Research Institute Zaria   | Biology, Bioconversion & Terming.  |
| 19. | Oil Exploration Companies Environmental Protection units e.g. NNPC, Shell etc. | Biology-Pollution oil spills clearing reclamation etc.                             |

BOTANY,ZOOLOGY, ECOLOGY(Nature of jobs that can be done)

1. Ministry of Agriculture (Forestry Department)
  - ◇ Vegetation analyses (Plant diversity) of the Area.
  - ◇ Desertification (Desert encroachment)
  - ◇ Afforestation:
  - ◇ How to establish plant nursery in the sericulture unit.
2. Research Institute
  - a) National Root crops Research Institute.
  - b) International Institute of Tropical Agriculture (IITA)  
Students are expected to know the food and cash crops grown at the different ecological zones.

- ◇ Their propagation, associated diseases and pest. Hybridization, selection & Propagation.
  - c) Nigerian Cereals Research Institute
    - ◇ Plant collection, Identification and preservation Techniques.
    - ◇ Know the varieties of crops in the area. Associated diseases, pest and nematodes.
  - d) Lake Chad Research Institute (LACRT), Maiduguri
    - ◇ Know crop varieties in the area
    - ◇ Associated diseases and pests.
    - ◇ Possible chemicals used for the control of the diseases and pests.
  - e) Institutes of Agricultural Research
    - ◇ Know types of crops grown in the area soil, rainfall, temperature requirements of the crops.
  - f) Cocoa research institutes
    - ◇ Know the economic trees - their hybridization, selection, propagation yield and disease resistivity as well as other associated factors retarding their productivity.
3. Companies
- Nigerian Tobacco Company (NTC), Highland Tea.
- ◇ Know the condition necessary for growth and development of the crop(s). Propagation (seeds, root, stem etc)
  - ◇ Diseases, pest and nematodes retarding the productivity.
4. National Park
- ◇ Plant species diversity (survey).
  - ◇ National Vegetation (Distribution)
  - ◇ Ecosystem, Ecology (interaction between plants and animals).
  - ◇ Animal diversity survey

### **Brief profile of academic staff of Department of Biological Sciences**

S/N	Full Names	Qualifications	Rank	Area of specialization	Status of Appointment	Telephone Number(s)	E-mail address
1	Ahmad Jibril Nayaya	B.Sc., M.Sc., Ph.D.	Reader	Ecology	Visiting	08036093905 08056585244	<a href="mailto:nayayaaj2001@yahoo.com">nayayaaj2001@yahoo.com</a>
2	Alhassan M Gani	B.Sc., M.Sc., Ph.D.	Professor	Botany	Visiting	08035920734	<a href="mailto:almohgani@yahoo.com">almohgani@yahoo.com</a>
3	Bala S Aliyu	B.Sc., M.Sc., Ph.D.	Professor	Botany	Visiting		
4	Ahmad AbdulHameed	B.Sc., M.Sc., Ph.D.	Professor	Ecology (Botany)	Visiting	08023354696	<a href="mailto:gesunnam@yahoo.com">gesunnam@yahoo.com</a>
5	Fatima B. Sawa	B.Sc., M.Sc., Ph.D.	Professor	Botany	Visiting	08035723799	<a href="mailto:fbsawa@yahoo.co.uk">fbsawa@yahoo.co.uk</a>
6	Auwal A. Barde	B.Sc., M.Sc., Ph.D.	Senior Lecturer	Zoology	Visiting	08038294978	<a href="mailto:bardeauwal@yahoo.com">bardeauwal@yahoo.com</a>
7	Adamu Babayo Samaila	BSc, MSc, PhD.	Reader	Parasitology	Visiting	08033854269 08054186395	<a href="mailto:adamusamaila13@yahoo.com">adamusamaila13@yahoo.com</a>
8	Sani Ibrahim	BSc, MSc, PhD.	Senior Lecturer	Biology	Visiting		
9	Hayatu Mohammed	B.Sc., M.Sc., Ph.D.	Lecturer I	Botany	Visiting		
10	Matouke Matouke Moise	B.Sc., M.Sc.	Lecturer II	Zoology	Full Time	08135944613	<a href="mailto:mosesmatouke@yahoo.fr">mosesmatouke@yahoo.fr</a>
11	Ali Haladu Gagman	B.Sc., M.Sc.	Lecturer II	Zoology (Parasitology & Entomology)	Full Time	08065384319	<a href="mailto:aligagmanhaladu@yahoo.com">aligagmanhaladu@yahoo.com</a>
12	Bashir Abubakar Mohammed	B.sc., Msc	Assistant lecturer	Biology (Biotechnology)	Full Time	07069002624	<a href="mailto:elbash1150@yahoo.com">elbash1150@yahoo.com</a> ,

13	Abubakar Sadiq Yusuf	B.Sc.	Graduate Assistant	Zoology	Full Time	07033055589	<a href="mailto:ysadiq66@gmail.com">ysadiq66@gmail.com</a>
14	Aliyu Abdulhamid Omar	B.Sc.	Graduate Assistant	Zoology	Full Time	08138401290 08020748122	<a href="mailto:aliyuo@yahoo.com">aliyuo@yahoo.com</a>
15	Hafsat Bagari	B.Sc.	Graduate Assistant	Zoology	Full Time	08069199509	
16	Aishatu Abubakar	B.Sc.	Graduate Assistant	Botany	Full Time	08030990399 08025093857	<a href="mailto:ashnuh@gmail.com">ashnuh@gmail.com</a>
17	Gloria Nyarim Joseph	B.Sc.	Graduate Assistant	Zoology	Full Time	08050392920	<a href="mailto:glossino@yahoo.com">glossino@yahoo.com</a>
18	Safwan Ismaila Idris	B.Sc.	Graduate Assistant	Botany	Full Time	08036366751	<a href="mailto:safwanismail1981@yahoo.com">safwanismail1981@yahoo.com</a>
19	Umar Aminu Muhammad	B.Sc.	Graduate Assistant	Environmental Biology	Full Time	08027274157	<a href="mailto:farukamohammed@yahoo.com">farukamohammed@yahoo.com</a>
20	Muhammad Adamu Hassan	B.Sc.	Graduate Assistant	B.Sc. Biology	Full Time	08066568192 08059147151	<a href="mailto:M3aminu@yahoo.com">M3aminu@yahoo.com</a>
21	Ismail Hassan	B.Sc.	Graduate Assistant	Ecology	Full Time	07038701615	<a href="mailto:hassanismail540@yahoo.com">hassanismail540@yahoo.com</a>