

**OBAFEMI AWOLOWO UNIVERSITY
ILE-IFE, NIGERIA.**



**FACULTY OF SCIENCE
DEPARTMENT OF BOTANY**

2019-2022 HANDBOOK

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION	4
1.1 Members of Staff of the Department	4
1.2 Historical Notes	7
1.2.1 History of the University	7
1.2.2 Mission, Vision, objectives of the University ..	10
1.2.3 History of the Faculty of Science	12
1.2.4 History of the Department of Botany	13
1.2.5 Mission, Vision, objectives of the Department ..	14
1.2.6 Members of the University	14
1.2.7 Officers of the University	15
1.2.8 Establishment of the University Council	15
(a) Functions	15
(b) Composition of the Members of Council..	16
1.3 Organization, Administration and Control ..	18
1.3.1 Congregation	19
1.3.2 Information on facilities	19
A. Hezekiah Oluwasanmi Library	19
B. Division of Students' Affairs	23
1.3.3 Rolls of Honours for students	24
1.4 University Examination Regulations	26
1.4.1 Registration for University Examinations ..	26
1.4.2 Absence from Examination	27
1.4.3 Examination Offences	28
1.5 The Course Unit System and the Computation of Grade Point Average (G.P.A.) as operated in Obafemi Awolowo University. ..	30
1.5.1 Introduction	30
1.5.2 Calculation of Grade Point Average (G.P.A) ..	32
1.5.3 Definition of Terms	32
i. Student Workload	32
ii. Total Number of Units (TNU)	32
iii. Cumulative Number of Units (CNU) ..	33
iv. Level of Performance Rating	33
v. Total Credit Points (TCP)	33
vi. Cumulative Credit Points (CCP).. ..	33
vii. Grade Point Average (GPA)	33
viii. Cumulative Grade Point Average (CGPA)..	34

1.5.4	GPA and CGPA sample computations	..	..	34
	i. Sample computations	..	..	34
	ii. Notes on sample computations	..	..	35
1.6	Miscellaneous notes on the course unit system	..	..	36
	i. Withdrawal from the University	..	..	36
	ii. Final assessment and class of degree.	..	..	36
1.7	Transfer within the University and length of stay in the University	..	..	36
2.0	BACHELOR OF SCIENCE DEGREE IN BOTANY			
2.1	Philosophy	..	..	37
2.2	Degree offered	..	..	37
2.3	Entry requirements	..	..	38
2.4	Requirements for the award of degree	..	..	38
2.5	Graduation Requirements	..	..	39
	(a) Foundation Programme Option B	..	..	39
	(b) Special Electives	..	..	39
	(c) Departmental Requirements	..	..	39
	(d) Restricted Electives	..	..	40
	(e) Free Electives	..	..	41
2.6	Outline of Programme for Parts I – IV	..	..	41
2.7	Course Content	..	..	44
2.8	Prizes in the Department	..	..	57
3.0	POSTGRADUATE PROGRAMME	..	..	58
3.1	Introduction	..	..	58
3.2	Degree Awarded	..	..	58
3.3	General Requirements	..	..	58
3.4	General Departmental Requirements	..	..	58
3.5	Course Work	..	..	58
	(a) General Plan	..	..	58
	(b) Course Requirements	..	..	59
	(c) Courses	..	..	60
3.6	Examinations	..	..	60
	(a) M.Sc.	..	..	60
	(b) Ph.D.	..	..	61
3.7	Staff for graduate programmes	..	..	61
3.8	Course syllabus	..	..	61
4.0	Area of Active research	..	..	67

1.0 INTRODUCTION

1.1 MEMBERS OF STAFF OF THE DEPARTMENT

(A) ACADEMIC STAFF

Name	Title	Specialization	Room Number
A.O.Isichei, B.Sc. , Ph.D. (Ife)	Professor	Plant Ecology	Rm G.15
J.O. Faluyi, B.Sc., M.Sc., Ph.D. (Ife)	Professor	Genetics	Rm G.28
J.I. Muoghalu, B.Sc., M.Sc. Ph.D (Ife)	Professor	Ecology	Rm G.16
A.A. Adelusi, B.Sc., M.Sc., Ph.D. (Ife)	Professor	Plant Physiology	Rm G.29
H.C. Illoh, B.Sc., (UNN), M.Sc., Ph.D (Ife)	Professor	Plant Anatomy and Taxonomy	Rm G.19
O. Adedeji, B.Sc., M.Sc., Ph.D. (Ife)	Professor	Plant Anatomy and Taxonomy	Rm G.06a
S.O.Oke, B.Sc., M.Sc., Ph.D. (Ife)	Professor	Plant Ecology	Rm G.32
A.M. Makinde, B.Sc., M.Sc. Ph.D (Ife)	Professor	Bryophyte Ecology	Rm G. 31
A.E. Folorunso, B.Sc., M.Sc. Ph.D (Ife)	Professor	Plant Taxonomy	Rm G.26d
S.A.Saheed , B.Sc., M.Sc., (Ife), Ph.D (Rhodes)	Reader	Plant Anatomy	Rm G. 33
F.A. Oloyede, B.Sc., M.Sc., Ph.D (Ife)	Reader	Taxonomy and Physiology of Ferns	Rm G.24a
A.M.A. Sakpere, B.Sc. (Ilorin), M.Sc. (Ibadan), M.Sc., Ph.D (Ife)	Reader	Plant Physiology	Rm G.12
A. I. Odiwe, B.Sc., M.Sc. (Ife), Ph.D (Wits.)	Reader	Plant Ecology	Rm G.26c
O.T. Oladipo, B.Sc.,	Senior	Plant Anatomy	Rm G.08

(Ed.), M.Sc., Ph.D (Ife)	Lecturer	and Taxonomy	
M. Oziegbe, B.Sc. (Ilorin), M.Sc., Ph.D (Ife)	Senior Lecturer	Plant Genetics	Rm G.07
O.O. Arogundade, B.Sc., M.Sc., Ph.D Ife	Lecturer I	Plant Anatomy and Morphology	Rm G.06
A. O. Bolaji, B.Sc., M.Sc., Ph.D (Ife)	Lecturer I	Plant Genetics	Rm G.06
A. Z. Ogbimi, B.Sc. (Benin), M.Sc., Ph.D (Ife)	Lecturer I	Lower Plants	Rm G.07
S. O. Azeez, B.Sc., M.Sc., Ph.D (Ife)	Lecturer I	Genetics	Rm 203
D. S. Akinyemi, B.Sc., M.Sc. (Ife)	Lecturer II	Ecology	Rm 203
E. R. Ogbimi, B.Sc., M.Sc., Ph.D (Ife)	Lecturer I	Physiology	Rm 203
M. A. Akin-Fajiye, B.Sc. (Ife)	Graduate Assistant	Biometry	Rm 203
M. O. Isa, B.Sc., M.Sc. Ph.D. (Ife)	Lecturer II	Bryophyte Ecology	Rm 203
O. M. Oseni, B.Sc., M.Sc. (Ife)	Graduate Assistant	Physiology	Rm 203

Name	Title	Specialization	Room No.
B) TECHNICAL STAFF			
Mr. J. A. Akinloye, B.Sc., M.Sc., (Ife)	Chief Technologist	Plant Anatomy	Rm G.26e
Mr. G. A. Ademoriyo HNC in Sc. Lab. Tech.	Principal Tech.	Chemistry/ Biochemistry	BGT 1.01a
Mr. E. Osunniran Govt. Trade Test Grade I	Snr. Workshop Supervisor	Carpentry	Carpenter's Workshop
Mrs. M. I. Igonor GCE O/L. B.T.C.	Snr. Lab. Supervisor	Genetics	Rm G.23b
Mr. A. W. Omole, ND, HND (Iree)	Lab. Assistant	Plant Physiology	Rm G.14
C) ADMINISTRATIVE STAFF			
Mrs. A.M. Olanrewaju	35&50wpm (Pit. Typ.), Commercial Four Cert.; Cert. in EDP (O.A.U. Ife), ND, HND (RSA institute incorporated, Ibadan)	Admin.	Rm G.11
Mrs. F.B. Ogunsina	Technical College Certificate, 35&50 wpm (Pit. Typ.), EDP, OMAG Cert.	Admin.	Rm G.09
Mr. O. Oluwanifise	WAEC; GCE and Cert in EDP	Admin.	Rm G.11

1.2. HISTORICAL NOTES.

1.2.1 History of the University

Obafemi Awolowo University, Ile-Ife is one of three Universities established in Nigeria between 1961 and 1962 as a result of the report submitted to the Federal Government in September, 1960, by a Commission it appointed in April 1959 under the Chairmanship of Sir Eric Ashby, Master of Clare College, Cambridge, to survey the needs of post-secondary and higher education in Nigeria over the next twenty years.

The Government of Western Nigeria first announced in 1960 its intention to establish as soon as possible a University in Western Nigeria which would be of the highest standard. Its policy would be to open its doors to students from all parts of the Federation and of the World.

The planning of the Obafemi Awolowo University was entrusted to two Committees. The one, a University Planning Committee comprising persons qualified to advise on the planning of a new University, and who in effect undertook the preparatory work connected with the establishment of the University pending the setting up of the Provisional Council of the University. The other, a University Parliamentary Committee, which would be advisory to the Minister of Education. On 8th June, 1961 the Law providing for the establishment of the Provisional Council of the university was formally inaugurated under the Chairmanship of Chief Rotimi Williams.

On 11th June, 1970, an Edict known as the University of Ife Edict, 1970 was promulgated by the Government of the Western State to replace the Provisional Council Law of 8th June, 1961. This Edict has since been amended by the Obafemi Awolowo University, Ile-Ife (Amended) Edict No. 11 of 1975 (Transitional Provisions) Decree No. 23 of 1975. This new Decree effected a take over of the Obafemi Awolowo University by the Federal Military

Government and established a Provisional Council as an interim governing body of the University which shall subject to the general direction of the Head of the Federal Government, control the policies and finances of the University and manage its affairs. This Provisional Council has since been replaced by a Governing Council.

The site selected for the University was at Ile-Ife, a town about 80 kilometres northeast of Ibadan in the Oyo State. Ife is famous as the centre of an ancient civilization and home of the Museum which contains the renowned Ife heads. It was intended that temporary buildings should be put up on the site to enable teaching to commence in October 1962 while the permanent buildings were being planned and erected. But when the Federal Government transferred the Ibadan Branch of the Nigerian College of Arts, Science and Technology to the University, it was decided that it would be unnecessary to put up temporary buildings at Ife and the University was temporarily located on the site of Ibadan Branch of the Nigerian College.

Teaching began in October 1962 with an initial enrolment of 244 students. The teaching, administrative and technical staff, either transferred from the Nigerian College or newly recruited from abroad numbered about eighty.

The University started with five Faculties – Agriculture, Arts, Economics and Social Studies (now Social Sciences), Law and Science. Six new faculties have since been added, namely the Faculty of Education (established on 1st October, 1967), the Faculty of Pharmacy (established on 1st October, 1969), the Faculties of Technology and Health Sciences (now College of Health Sciences) (both established on 1st October, 1970) Faculty of Administration (which replaces the former Institute of Administration with effect from 1st October 1979) and Faculty of Environmental Design and Management (established on April 6, 1982).

In 1992, the University established a collegiate system with five Colleges. The system did not function effectively and was abandoned after two years. However, the Postgraduate College and the College of Health Sciences were retained. The College of Health Sciences now comprises of the Faculties of Basic Medical Sciences, Clinical Sciences and Dentistry.

The Adeyemi College of Education located in Ondo and the Institute of Agricultural Research and Training in Ibadan were initially integral part of the University. Although the Adeyemi College was separated from the University in 1975, however, there is still a close relationship between the two institutions. The College offers degree programme of the University under a system that is closely monitored by University.

The Institute of Agricultural Research and Training, Ibadan with a branch at Akure in Ondo State, used to be fully superintended by the University in 1991. However, the Akure branch and the College of Animal Science of the Institute continued to report to the Federal Government through the Director of the institute. In terms of funding, the Institute of Agricultural Research and Training now relates to the Federal Ministry of Agriculture while the University still has administrative responsibility for the Research and Administrative staff of the Institution. The Director and the Secretary of the institute are responsible to the University through the Vice-Chancellor and Registrar respectively. The Vice-Chancellor is the Chairman of the Institute's Governing Board.

The following other Institutes and major units exist in the University:

- The Natural History Museum
- The Institute of Ecology and Environmental Studies
- The Centre for Gender and Social Policy Studies
- The Centre for Industrial Research and Development
- The Institute of Public Health
- The Institute of Cultural Studies

The Technology Planning and Development Unit
The Computer Centre
The Drug Research and Production Unit
The Equipment maintenance and Development Centre
The Central Technological Laboratory Workshop
The Central Science Laboratory
The Distance Learning Centre

Finally, some other agencies over which the University has no direct, or, in some cases limited control, have premises within the University.

The Regional Centre for Training in Aerospace Surveys
The National Centre for Technology management
The Centre for Energy Research and Development
The African Regional Centre for Space Science and Education in English

The student population rose steadily from 244 in 1962/63 to 28,758 at the end of the 2005/2006.

1.2.2 Mission, Vision, Objectives of the University

(a) MISSION

To create a teaching and learning community for imparting appropriate skills and knowledge, behaviour and attitude; advance frontiers of knowledge that are relevant to national and global development; engender a sense of selfless public service; and promote and nurture the African culture and tradition.

(b) VISION

The vision is of a top rated University in Africa, ranked among the best in the world, whose products occupy leadership positions in the public and private sectors of the

Nigerian and global economy, that has harnessed modern technology, social, economic and financial strategies, built strong partnerships and linkages within and outside Nigeria and whose research contributes a substantial proportion of innovations to the Nigerian economy.

(c) STRATEGIC OBJECTIVES

1. To produce graduates of international standard, with appropriate knowledge and skills in their field of study, who will be highly employable and able to employ themselves.
2. To provide high quality research and development activities that will promote the development of the Nation and enhance the image of the University and the researchers.
3. To harness modern technology especially ICT and modern social, economic and financial strategies to run a cost of efficient and effective academic programme and institutional management.
4. To provide services that has relevance to and impact on the local community and the Nation.
5. To provide conditions of study, work and living in the University Community that is of appropriate standard.
6. To expand access to tertiary education in the face of unmet demand.
7. To operate as an equal opportunity educational institution, sensitive to the

principle of gender equity and non-discriminatory on the basis of race, ethnicity, religion or physical disability.

1.2.3 History of Faculty of Science

The Faculty of Science was one of the foundation faculties established at the inception of the University of Ife in 1962. It was located at the Ibadan Campus up till January 1970 when it moved in its entirety to its present facilities at Ile-Ife.

The student's population within the Faculty has grown rapidly from the initial intake of 80 in 1962 to 2,768 registered students at the end of 2005/2006 session. It is thus the Faculty with the largest number of students in the University.

Similarly, the range of programmes offered by the Faculty has increased considerably from five, Physics, Chemistry, Mathematics, Botany and Zoology in 1962. The Faculty offers academic programmes leading to the B.Sc., M.Sc., M.Phil. and Ph.D degrees in eleven major discipline areas (Applied Geophysics, Botany, Biochemistry, Engineering Physics, Geology, Mathematics, Microbiology, Physics, Zoology, Statistics and Mathematics) within eight Departments namely Biochemistry, Botany, Chemistry, Geology, Mathematics, Microbiology, Physics and Zoology.

Apart from the above, there are three vital services units, the Natural History Museum, the Technology Training Scheme and the Biological Gardens within the Faculty.

Apart from the Faculty academic programmes, it is completely responsible for teaching basic science courses to all new entrants to the Science-oriented Faculties and offers in addition, services courses to the Faculties of Agriculture, Education, Environmental Design and Management, Health Sciences, Pharmacy, Social Sciences and Technology.

The Faculty has at present over 208 academic staff.

1.2.4 History of the Department of Botany.

The University began operation at the former Campus of the Nigeria College of Arts, Science and Technology, Ibadan, in October 1962 with five Faculties, namely, Agriculture, Arts, Economics and Social Sciences (Now Social Sciences), Law and Science. The Departments of Botany and Zoology that made up of Biological Sciences Section of the Faculty of Science moved (along with the Faculty of Agriculture) to Ile-Ife in January 1968. These two Departments were later merged and expanded to make the Department of Biological Sciences with programmes in Botany, Biochemistry, Zoology and Microbiology. They were all housed in the Agriculture buildings until, the Biological Sciences buildings were completed at the beginning of the 1974/75 session. The different programmes were upgraded into full-fledged Departments as they moved into the new buildings in 1975 and they remained so till today. Thus the Department of Botany, Obafemi Awolowo University, Ile-Ife came into being for the second time and has graduated a large number of students at the B.Sc., M.Sc., Ph.D levels since then.

All the members of academic staff, at one stage or the other were trained in the Department. The above is as a result of the training/development programmes and mentorship policy of the Department. Many of the graduates of this Department are already Professors in Universities all over Nigeria and outside Nigeria in training/developing other people in their special area.

The Department carries out periodic reviews of its Curriculum in line with the National Universities Commission guidelines, which is in response to the needs of Nigeria as a nation as well as the outside world to be in consonance with the 21st Century so that the graduates we produce would be employable and can also employ themselves.

1.2.5 Mission, Vision, Objectives of the Department of Botany

Mission:

Our mission is to promote research and educate in basic plant biology.

Vision:

Our vision is to be a progressive Department that serves as a national centre for the plant sciences by training undergraduates and graduates who will be leaders in Botanical education and research and to energize the public appreciation of plants.

Objectives:

The strategic objectives of the Department are to:

- i. Conduct research in fundamental plant biology and produce graduates with the relevant skills and knowledge necessary for productive research and teaching.
- ii. Provide courses in plant biology to students of other Departments whose degree options require a working knowledge of Botany.
- iii. Expose students to maintain laboratory and field resources.
- iv. Provide opportunity for students to eventually specialize in any of the core areas of Botany: Morphology/Taxonomy, Anatomy, Genetics, Physiology, Ecology and Lower Plants.

1.2.6 Members of the University

The members of the University as defined on statute 2(1) are:

- (a) the Officers of the University;

- (b) the members of the Council;
- (c) the members of the Senate;
- (d) the members of the Academic Staff;
- (e) the Graduates;
- (f) the students; and such other persons as may by Statute be granted the status of members.

A person shall remain a member of the University only as long as he is qualified for such membership under any of the sub-paragraphs of paragraph (1) of this Statute.

1.2.7 The Officers of the University

The Officers of the University as contained in Statute 3 shall be:

- (a) the Chancellor;
- (b) the Pro-Chancellor;
- (c) the Vice-Chancellor;
- (d) the Deputy Vice-Chancellor (Academic);
- (e) the Deputy Vice-Chancellor (Administration);
- (f) the Registrar;
- (g) the Librarian;
- (h) the Bursar; and
- (i) such other persons as may by Statute be granted the status of officers.

1.2.8. Establishment of the University Council

(a) Functions

The University Council to be known as the Council of the Obafemi Awolowo University, Ile-Ife was established by the Edict. The Edict states that Council shall be the governing authority of the University and shall have the custody, control and disposition of all the property and finances of the University and, except as may otherwise be provided in the Edict and the Statutes, shall manage and superintend generally the affairs of the University and, in any matter concerning the University not provided for or under this

Edict, the Council may act in such manner as appears to it best calculated to promote the interests, objects and purposes of the University.

The Council, subject to the provisions of the Edict and Statutes has the following functions among others:

- (i) to determine, in consultation with Senate, all University fees;
- (ii) to establish, after considering the recommendation of the Senate on that behalf, Faculties, Institutes, Schools, Boards, Departments and other units of learning and research; to prescribe their organization, constitution and functions and to modify or revise the same;
- (iii) to authorize, after considering the recommendations of the Senate in that behalf, the establishments for the academic in the University, and with approval of the Senate, to suspend or abolish any academic post except a post created by this Edict or the Statutes;
- (iv) to authorize the establishments for the administrative staff and other staff in the University and to suspend or abolish any such posts other than posts created by the Edict or the Statutes;
- (v) to make the appointments authorized by this Edict and the Statutes;
- (vi) to exercise powers of removal from office and other disciplinary control over the academic staff, the administrative staff and all other staff in the University;
- (vii) to supervise and control the residence and discipline of students of the University and to make arrangements for their health and general welfare.

(b) Composition of the Members of Council

The Council as contained in Statute 10(1) as amended by Decree No. 11 of 1993 and Decree 25 of 1996 shall consist of the following members:

- (i) Ex-Officio Members: Pro-Chancellor
The Vice-Chancellor
The Deputy Vice-Chancellors
- (ii) 1 member from the Federal Ministry of Education
- (iii) 4 members appointed by National Council of Ministers
- (iv) 4 members of Senate appointed by Senate
- (v) 2 members of the Congregation elected by the Congregation
- (vi) 1 member of Graduates Association elected by Graduates Association

The Senate shall prescribe which Departments and subjects of study shall form part or be the responsibility of each of the Faculties. The next level of organization is the Faculty where the teaching and other activities of the Departments are co-ordinated. Proposals generally come from Departments to the Faculty Board although they can also be initiated at the Faculty level in which Departments normally have an opportunity to consider them before the Faculty Board takes a decision. The membership of the Faculty Board is stipulated in Statute 13(3) thus:

- (a) The Vice-Chancellor
- (b) The Deputy Vice-Chancellors
- (c) The Dean of the Faculty
- (d) The Professors and Heads of Departments comprising the Faculty;
- (e) Such other full-time members of the academic staff of the Departments comprising the Faculty as the Senate may determine after considering the recommendation of the Faculty Board;
- (f) Such other Professors and other Heads of Departments, as the Senate may determine after considering the recommendation of the Faculty Board;

- (g) Such other persons within or outside the University as the Senate may appoint after considering the recommendation of the Faculty Board.

The next level is that of Departments which consist of groups of teachers and sometimes Research Fellows in a single subject with a Head who is usually although not always a Professor generally appointed by the Vice-Chancellor.

The Department is the normal basic unit of academic organization. It is at this level that the organization of teaching and the use of research facilities are primarily worked out. Senate may however recommend the creation of Institutes for groups of specialized subjects or discipline that require interdisciplinary research efforts and thus, cut across Faculties in scope.

1.3 Organization and Administration

The Vice-Chancellor is the Chief Executive Officer of the University and five other Principal Officers of the University, namely; the Deputy Vice-Chancellors (2), the Registrar, the University Librarian and the Bursar report to him. The University Librarian is in charge of the University Library while the Bursar takes charge of the University finances. The Registrar is the Secretary to Council and the Chief Administrative Officer of the University and he assists the Vice-Chancellor in the day-to-day administration of the University. He is also the Secretary to Senate and heads the Registry, comprising the Directorate of Academic Affairs, the Directorate of Council Affairs, Division of Corporate Services and the Director of Personnel Affairs. The Planning, Budgeting, Monitoring/Management Information System Unit takes care of the academic planning , budgeting and monitoring needs of the University and is under the Vice-Chancellor's Office.

The University Central Administration also includes some Units providing common services. They are the Medical and Health Services, the Division of Maintenance Services, the Physical

Planning and Development Unit and the Computer Centre, Heads of these units report to the Vice-Chancellor.

1.3.1 Congregation

The Congregation comprises all full-time members of the academic staff and every member of the administrative staff who holds a degree of any recognized University. It discusses and declares an opinion on any matter whatsoever relating to the well being of the University. It has twelve elected members in Senate and two elected members in the University Council.

1.3.2. Information on Facilities

HEZEKIAH OLUWASANMI LIBRARY

(i) PLAN OF THE LIBRARY

The Library consists of the North and South wings, which are connected by walkways on two levels.

(ii) MEMBERSHIP

Membership of the Library is available, on completion of a registration card, to all students, members of the senior staff of the university and such other persons as may be determined by the Library Committee or the University librarian on behalf of it.

Students are required to renew their registration at the beginning of each academic year. Library Cards and Borrower's Tickets are not transferable; books issued on them remain the responsibility of the person whose name appears on them.

A Lost Library Card or Borrower's Ticket may be replaced on submission of a written application.

(iii) THE LIBRARY COLLECTION

Hezekiah Oluwasanmi library now contains over 380,000 volumes. It consists of two main areas:

- (a) The Undergraduate Areas and
- (b) The Research Areas.

1. **Serial Collection**

The Serials Collection consists of:

- (i) Current journals, the most current issues of which are shelved in the display section of the Serials Room.
 - a. Latest back files i.e. the latest 10 years of journals which are on open access to registered senior staff and postgraduate students.
 - b. Older back files i.e. journals older than ten years are on closed access to all categories of readers who must obtain and complete request forms at the serials hatch.

2. **African Special Collection**

The African Special Collection is a collection of rare and other books primary interest to people whose fields of interest are in African Studies. Staff publications and theses submitted for hither degrees of the University as well as of other Universities are also housed there. The Collection is closed access.

3. **Documents Collection**

The Documents Collection includes official publications of the Federal Government of Nigeria, the old regional governments, the present state governments and the Federal Capital Territory. It also includes publications of other African governments and international organizations.

4. **Reference Collection**

Dictionaries, encyclopedia, handbooks, directories, atlases, University Calendars, etc. are shelved in the Reference Room. Bibliographies, indexes and abstracts are available in the Bibliography Room. Reference books do not ordinarily circulate.

A newspaper clippings file (*post-October; 1985*) and a vertical file of reprints and other pamphlet type material is kept in the Reference Room.

5. **Reserve Collection**

(i) **Day reserve collection**

Multiple copies of textbooks, particularly some of those recommended for specific courses, are shelved in the Reserve Books Room on Floor 3 North Wing East.

(ii) **Two Hour Reserve**

Some other materials, periodical articles in particular, are placed on 2-hour reserve. These may be obtained on request (signature and seat number required) and retained for a period of two hours at a time, subject to renewal, provided other readers have not demanded the materials.

6. **Recent Acquisitions**

A selection of books added to the Library stock is normally displayed for several days before being put in the main collection. The books may not be borrowed while on display but may be reserved at the loans Desk.

CATALOGUES

A library catalogue is a finding list of books and other materials available in the library. The following catalogues can be found in the Catalogue Hall:

- (i) The Author/Title Catalogue
- (ii) The Subject Catalogue
- (iii) The Shelf list
- (iv) The Serials Catalogue
- (v) The Documents Catalogue

HOW TO BORROW A BOOK

When you have found the book you want to borrow, you will be required to sign your name and address on the book card provided in duplicate. You must surrender a Borrower's Ticket for each book borrowed.

When you return a book, you must ensure that you receive your Borrower's Ticket back immediately.

RESERVATION

A book can be reserved by filling a reservation slip; in which case, it will not be renewed for the present borrower when returned, and, if it is already overdue, it will be recalled at once.

INTER-LIBRARY LOAN

If the book you require is not in stock, it is often possible to borrow it from another library. This service is dependent on goodwill and cooperation between libraries, and readers who benefit from it are required to observe the regulations applying to each loan.

PHOTOCOPYING SERVICES

Within the limitations imposed by copyright, the library is able to supply readers with photocopies of periodical articles and parts of books at moderate charges.

PENALTIES FOR OVERDUE OR LOST BOOKS

Penalties for overdue books will be imposed as follows:-

- (a) N5.00 per day for the first 30 days; thereafter all loan privileges will stop.
- (b) Books specially recalled by the university Librarian will attract a fine of N10.00 per day after third day from the date of recall.

- (c) Books lost or damaged will attract a fine five times the current cost of the books.
- (d) No student will be allowed to attend the Graduation Ceremony or receive his/her certificate without a clearance certificate from the University Library to the effect that no book or fine is outstanding against him or her.

LIBRARY OPENING AND CLOSING HOURS

Monday – Friday	8.00 a.m.	-	10.00 p.m.
Saturday	8.00 a.m.	-	4.00 p.m.
Sunday	2.00 p.m.	-	10.00 p.m.

Vacation Period

Monday – Friday	8.00 a.m.	-	6.00 p.m.
-----------------	-----------	---	-----------

B. Division of Students' Affairs.

1. Guidance and Counseling Unit:

The Division of Students' Affairs has Professional Counselors who are committed to helping students grow in self-understanding in the process of integrating their personal and academic experiences. The services are free to students and are confidential (i.e. not used as part of his/her other University records). The services include personal counseling, group counseling, study skills improvement, tests anxiety reduction, personal crisisintervention, psychological testing, career and occupational counseling and settlement of grievances between students. Where necessary, consultations are made with campus organizations, specialists and academic

Departments, to ensure that students' problems are resolved satisfactory.

The Counselors can be contacted in Rooms 9 and 10 Division of Students' Affairs between 10.00 a.m. and 2.00 p.m. Monday to Friday.

2. Scholarship and Financial Assistance:

The Division of Students' Affairs serves as a link between students and sponsoring authorities, both within and outside Nigeria. Students are advised to check the Notice Boards in their respective faculties as well as those at the Division of Student Affairs Building for advertisements and other relevant information.

Liaison is also maintained between students and governments at various levels for scholarship and bursaries.

1.3.3 ROLL OF HONOURS FOR STUDENTS

Senate at a Special Meeting held on Wednesday, 1st November, 2006 decided that Roll of honours for Students be instituted in the University to enhance discipline and good performance among students.

All students are enjoined to strive to be on the Honours Roll.

The details are as follows:

- (i) The Honours Roll should be at three levels, namely:
 - (a) Departmental Honours Roll
 - (b) Provosts/Deans Honours Roll
 - (c) University/Vice-Chancellor's Honours Roll
- (ii) The beneficiaries must have a minimum CGPA of 4.0 for Departmental Honours Roll; 4.25 for Provost/Deans honours Roll and 4.5 for Vice-Chancellor/University Honours Roll in all the

Faculties except the Faculty of Pharmacy and College of Health Sciences where the candidates are expected to have a cumulative average of 60% and 62% respectively.

- (iii) The beneficiary must maintain this grade annually to continue to enjoy the award.
- (iv) The recommendations must be processed along with results of Rain Semester examinations.
- (v) The student must be of good conduct.
- (vi) He/she must not have outstanding or carry-over courses and must not be repeating the year.
- (vii) No student on Leave of Absence shall enjoy the Annual Roll of Honours Award.
- (viii) No student that has a disciplinary problem shall enjoy the award.
- (ix) The award shall be based on the recommendation of the Departmental Board of Examiners and the Faculty Board of Examiners, while that pertaining to the Vice-Chancellor/University shall be processed through the Committee of Deans.
- (x) Names of beneficiaries shall be displayed as follows;
 - Departmental Honours - Departmental Notice Board
 - Provost/Deans Honours - Faculty Notice Board
 - Vice-Chancellor/
University Honours - Floor '0' Secretariat Building
- (xi) Each beneficiary shall be given a certificate.

1.4 University Examination Regulations

Some University Examination Regulations students should note as contained in University Examination Regulations for first Degrees, Diplomas and Certificates are:

1.4.1. Registration for University Examinations

- (a) A candidate for a University examination must have registered the courses in the prescribed format not later than the closing date prescribed for registration for such courses. Any candidate who fails to register for courses at the appropriate time as prescribed by Senate will not be allowed to take any examination in such courses. Any examination taken without course registration shall be null and void.
- (b) Students who register for courses are committed to the number of units registered for and are expected to take examinations in such courses. If a student failed to take an examination he would be scored 'OF' for the number of units he had registered for and in which he had failed to take the prescribed examination.
- (c) Any student who does not have any course to offer in a particular semester should apply for leave of absence.
- (d) A candidate who has less than 15 units in a particular semester to graduate should apply to his/her Faculty Board for permission to register for less than 15 Units. Failure to do so constitutes a breach of regulation which may result in the non-processing of the candidate's results.
- (e) A candidate, who cannot register for courses during the prescribed period for registration because of an illness, must ensure that medical report on his illness is forwarded by him or his parents/sponsors to reach the Dean of his Faculty not later than four weeks after the end of the normal registration period as scheduled in the University Calendar. Such a medical report should be forwarded for authentication by the Director of Medical and Health Services for it to be considered valid. Such a

candidate shall be exempted from the penalties of late registration. All applications should be routed through the Head of Department.

- (f) Students must attend a minimum of 75% of course instructions including lectures, tutorials and practicals where required to qualify to sit for examination in any course.

1.4.2 Absence from Examination

Candidates must present themselves at such University examinations for which they have registered. Candidates who fail to do so for reason other than illness or accident shall be bound by the following regulations:

- (a) Any student who fails to register for courses during one semester without permission should be deemed to have scored “0F” in the minimum number of units required for full time students (i.e. 15 Units).
- (b) Candidates who registered for courses, attended classes regularly, did all practical and tests but did not take required semester examinations should be given a continuous assessment grade in each of the affected courses and a grade of “0F” in the examination which they should have taken, but which they did not take.
- (c) Candidates who have less than 15 units to graduate but fail to take the required examinations should be deemed to have scored “0F” in the outstanding courses only provided such candidates obtained permission to register for less than 15 units.
- (d) Any candidate who on account of illness, is absent from a University examination may be permitted by the Senate on the recommendation from the appropriate Faculty Board, to present himself for such examination at the next available opportunity provided that:
 - (i) A full-time student in the University shall report any case of illness to the University Health Centre at all times.

- (ii) When a student falls ill during examination he should report to the Director, Medical and Health Services before attending any hospital outside the University. A report of sickness should be made to the Registrar within a week and a medical certificate of validation of his illness within three weeks.
- (iii) When a student falls ill before an examination he shall be under an obligation to send a medical report countersigned by the Director, Medical and Health Services within one week of such illness. Any time outside this period, shall be considered on its merit.
- (iv) The Director of Medical and Health Services should within 48 hours, submit a medical report on a candidate who is ill during an examination and is taken to the Health Centre or referred by it to the hospital for treatment.
- (v) A candidate applying for leave of absence on medical grounds must forward his application together with a medical report to the Dean of his Faculty through his Head of Department. The Medical Report must be countersigned by the Director, Medical and Health Services. All applications for Leave of Absence must be taken by the appropriate Faculty Board.

1.4.3 Examination Offences

- (a) A candidate shall not be allowed during an examination to communicate by word or otherwise with any other candidates nor shall he leave his place except with the consent of an invigilator. Should a candidate act in such a way as to disturb or inconvenience other candidates, he shall be warned and if he persists he may, at the discretion of the invigilator be excluded from the examination room. Such action by the invigilator must also be reported

in writing through the Head of Department to the Vice-Chancellor within 24 hours.

- (b) It shall be an examination offence for any student, staff or any person whatsoever, to impersonate a candidate in any University examination. Any student or staff of the University found guilty under this regulation shall be subjected to disciplinary action by the appropriate authority of the University.
- (c) No candidate shall take into an examination room or have in his possession during examination any book or paper or printed or written documents, whether relevant to the examination or not, unless specifically authorized to do so. Any invigilator has authority to confiscate such documents.
- (d) Mobile phones are not allowed in examination halls.
- (e) A candidate shall not remove from an examination room any papers, used or unused, except the question paper and such book and papers, if any, as he is authorized to take into the examination room.
- (f) Candidates shall comply with all “direction to candidates” set out on an examination answer book or other examination materials supplied to them. They shall also comply with duration given to them by an Invigilator.
- (g) Candidates shall not write on any paper other than the examination answer books. All rough work must be done in the answer books and crossed out neatly. Supplementary answer books, even if they contain only rough work must be tied inside the main answer books.
- (h) When leaving the examination room, even if temporarily, a candidate shall not leave his written work on the desk but he shall hand it over to an invigilator. Candidates are responsible for the proper return of their written work.

- (i) Smoking shall not be permitted in examination room during examination sessions.
- (j) Any candidate or staff who attempts in any way to unlawfully have or give pre-knowledge of an examination question or to influence the marking of scripts or the award of marks by the University examiner shall be subject to disciplinary action by the appropriate authority of the University.
- (k) If any candidate is suspected of cheating, receiving assistance or assisting other candidates or of infringing any other examination regulation, a written report of the circumstance shall be submitted by the invigilator to the Vice-Chancellor within 24 hours of the examination session. The candidate concerned shall be allowed to continue with the examination.
- (l) Any candidate suspected of examination malpractice shall be required to submit to the invigilator a written report immediately after the paper. Failure to make a report shall be regarded as a breach of discipline. Such report should be forwarded along with the Invigilators report to the Vice-Chancellor.
- (m) Where a Head of Department fails to forward a report on examination malpractice to the Vice-Chancellor such action would be considered a misconduct.

1.5 THE COURSE UNIT SYSTEM AND THE COMPUTATION OF GRADE POINT AVERAGE (GPA) AS OPERATED IN OBAFEMI AWOLowo UNIVERSITY.

1.5.1 Introduction

The course unit system is a system whereby programmes are designed with courses, which are weighted and classified into various levels for students in the institution of higher learning.

Courses are assigned units depending on the volume of work required to complete the course and this includes lectures, tutorials and practicals. Any student can take the courses at any level provided there are no (constraints) prerequisites for these courses. For instance, a Part I student can offer a course at any level provided the student has the prerequisites required for that course, while a Part IV student can still offer a Part I course if such a student so desires. However, it is generally desirable that lower level core courses are taken and passed before proceeding to high level ones.

The system allows a student to spread his programme evenly over the semesters provided such a student keeps to the rules and regulation of the system. For instance there are minimum and maximum numbers of units a student can register for in a semester. Every semester is as important as the other. A wise student is encouraged to attempt a reasonable number of units he/she can cope with to ensure a qualitative performance.

It is compulsory for every student to interact with his/her Part Adviser (See the Departmental notice board for list) to discuss his/her programme and courses before proceeding to register during any semester. This is extremely important to ensure that the student registers appropriately. There are many issues that are linked to registration; therefore, proper interaction with an Adviser will guarantee that a student does not register for more courses than he/she can cope with among other issues. In the past, many students have found themselves in avoidable situations resulting in withdrawal advice from the University arising from failure to interact with the Part Advisers prior to registration. The Adviser is expected to patiently attend to students allocated to him/her, check through all the previous coursework result of the individual students to be able to guide him/her on the course he/she should register for in a particular semester.

Apart from the end of semester examination, there are continuous assessments during each semester. These tests and the end of

semester examination make up the set of semester examinations for each course. Appropriation of scores to make the final mark of 100% varies from one Faculty to another, but continuous assessment scores cannot be more than 40% of the 100%.

1.5.2 Calculation of Grade Point Average (GPA)

This section is designed to acquaint students with the procedure for computing the Grade Point Average (GPA) for each set of semester examinations and for upgrading the computations to obtain the Cumulative Grade Point Average (CGPA) at any point in time during each student's course of study.

It is strongly advised that every student should learn how to compute (and actually do compute his own) GPA and CGPA. By thus computing and keeping a record of his CGPA, the student will be fully aware of what effort he must put in to remain in the University or to graduate in a desired class. This is the only way you can be in a position to be on your guard and monitor the quality of your efforts.

1.5.3 Definition of Terms

It is necessary to first understand and be thoroughly familiar with certain terminologies and abbreviations that are commonly used in the computation of Grade Point Average. These are defined as follows:

- (i) **Student Workload:** This is defined in terms of course units. One unit represents one hour of lecture or one hour of Tutorial or 2-4 hours of practical work per week throughout a semester. Thus for example, a course in which there are 2 hours of lectures and 1 hour of Tutorial per week is a 3 unit course.
- (ii) **Total Number of Units (TNU):** This is the total number of course units carried by a student in a particular semester. It is the summation of the load Units on all Courses carried during the semester.

For example, a student who is carrying 6 courses of 3 units each has a TNU of 18 for that semester.

(iii) **Cumulative Number of Units (CNU):** This is the summation of total number of Load Units over all the semesters from the beginning to date. A student who is prone to repeating courses will finish (if he does not drop out) with a higher CNU than his non-repeating colleague and will most likely require a longer time to complete requirements for the award of Degrees.

(iv) **Level of Performance Rating:** This is the rating of grades obtained in terms of credit points per load unit. The rating used is as follows:

Level of Performance	Rating (credit points per unit)
A = Excellent	(70 – 100%) 5
B = Very Good	(60 - 69%) 4
C = Good	(50 - 59%) 3
D = Satisfactory	(45 - 49%) 2
E = Adequate	(40 - 44%) 1
F = Failure	(0 - 39%) 0

Based on the above, a student who obtained a grade of ‘A’ in a 4-unit course has scored 20 Credit points and one who obtained a grade of C in that course has scored 12 credit points.

(v) **Total Credit Points (TCP):** This is the sum of the products of the course units and rating in each course, for the entire semester period. For example, consider a student who took 4 courses of 5 units each. Let’s say the grade obtained in the four courses were C.B.F.D. respectively. The TCP of this student is obtained as $5 \times 3 + 5 \times 4 + 5 \times 0 + 5 \times 2 = 45$.

(vi) **Cumulative Credit Point (CCP):** This is the summation of Total Credit Points over all semesters from beginning to date.

(vii) **Grade Point Average (GPA):** This is the total credit points’ (TCP) divided by the total units

(TNU). For example, consider the student's scores referred to above His TCP is 45 and of course, his TNU is 20 (i.e. 4 courses at 5 units each for the semester). The highest GPA that can be earned is 5.0 and that is when a student has earned a grade of 'A' in every course during the semester. The lowest GPA obtainable is 0.0 and this would happen if the student has F all round during the semester.

- (viii) **Cumulative Grade Point Average (CGPA):** This summation of TCPs for all semesters divided by the summation of TNUs for the said semesters. Like the GPA, CGPA, obtainable ranges from 0 to 5.

1.5.4 GPA AND CGPA SAMPLE COMPUTATIONS

- i. **Sample Computations:** Consider a student who has enrolled in a course programme designated as BOT and has just completed 2 full semesters in the University. His course programme and GPA and CGPA could be as follows:

Part I - Harmattan

Course Code	Units	Grades	Credit Points	GPA/CGPA
BOT 101	3	68%B	$3 \times 4 = 12$	GPA = $73/21 = 3.48$ CCP = $73 + 0 = 73$ TLU = $21 + 0 = 21$ CGPA = $73/21 = 3.48$
BOT 103	1	74%A	$1 \times 5 = 5$	
CHM 101	4	52%C	$4 \times 3 = 12$	
CHM 103	1	60%B	$4 \times 1 = 4$	
PHY 105	4	70%A	$4 \times 5 = 20$	
PHY 107	1	72%A	$1 \times 5 = 5$	
SSC 101	3	64%B	$3 \times 4 = 12$	
ZOO 101	3	32%F	$3 \times 0 = 0$	
ZOO 103	1	50%C	$1 \times 3 = 3$	
	TNU 21		TCP 73	

Part I - Rain

Course Code	Units	Grades	Credit Points	GPA/CGPA
BOT 102	3	72%A	$3 \times 5 = 15$	GPA = $64/21 = 3.05$
BOT 104	1	70%A	$1 \times 5 = 5$	CCP = $64 + 73 = 137$
CHM 102	4	65%B	$4 \times 4 = 16$	TLU = $21 + 21 = 42$
CHM 104	1	60%B	$1 \times 4 = 4$	CGPA = $137/42$
PHY 106	4	48%D	$4 \times 2 = 8$	= 3.26
PHY 108	1	57%C	$1 \times 3 = 3$	
SSC 102	3	67%B	$3 \times 4 = 12$	
ZOO 102	3	28%F	$3 \times 0 = 0$	
ZOO 104	1	40%E	$1 \times 1 = 1$	
	TNU 21		TCP 64	

ii. Notes on the Sample Computations:

- (a) The Student had obtained a grade of F in ZOO 101 and ZOO 102 at the end of Second Semester. These courses thus contributed to his TNU but zero in TCP. He repeated the course ZOO 101 and ZOO 102 and earned grade D and E respectively at the end of Semester II. Thus repeats are included in the computation of results many times as they occur in the course.
- (b) During Semester II, the students had to drop other courses in order to accommodate ZOO 101 and ZOO 102 which he had failed (and must repeat sooner or later) in Semester I. If he had tried to take ZOO 101 and ZOO 102 without dropping anything, his TNU for semester that would have been 29, which exceeds the permissible upper limit of 22. Overloads are not normally allowed. There are no more Examination Re-sits in almost all the Faculties, therefore any course failed has to be repeated when it is available and must be passed before graduation.
- (c) Students are strongly advised to consult with their course advisers before registering for courses and on other academic problems that they may have.

1.6 MISCELLANEOUS NOTES ON THE COURSE UNIT SYSTEM

- (i) **Withdrawal from the University:** A student whose CGPA falls below 1.0 at the end of a semester shall be placed on probation during the following semester, if he/she fails to achieve a CGPA of at least 1.0 at the end of that semester, he/she shall be required to withdraw from the University.
- (ii) **Final Assessment and Class of Degree:** A student who has satisfactorily completed all requirements for the degree with CGPA of not less than 1.50 may be awarded an Honours degree as follows:

Class	CGPA
First Class	4.50 and above
Second Class (Upper Division)	3.50 - 4.49
Second Class (Lower Division)	2.40 - 3.49
Third Class	1.50 - 2.39
Pass	1.00 - 1.49

- (iii) Passes in 12 Units of Special Electives is a requirement for graduation.
- (iv) A candidate who does not reach a CGPA of 1.50 but whose CGPA is not less than 1.00 at the end of the programme is awarded a pass degree (i.e. without Honours). ****CGPA calculation is on all courses, but excluding Special Electives.

1.7 TRANSFERS WITHIN THE UNIVERSITY AND LENGTH OF STAY IN THE UNIVERSITY

- (a) To qualify for a degree, a candidate will normally be required to spend a minimum of two academic years at the Obafemi Awolowo University.

- (b) If a student transfers from one Faculty to another, the transfer would be treated as if he/she is just being admitted into the University since as part of the requirement for graduation the student has to take all the foundation/compulsory courses in the new Faculty/Department. In that case his/her stay in the new Faculty/Department should be 1½ times the number of semesters required to complete a programme.

- (c) Where a student transfers from a science based Faculty to another, the computation of is result in the new Faculty shall take cognizance of his previous CGPA in the new Department. The duration of they stay in the university will be what remains of the 1½ times the number of semesters required to complete the programme as approved by Senate.

- (d) Where a student is transferring from a science-based to a Humanities/Arts-based Faculty or vice-versa, the transfer should be treated as if the student is just being admitted into the University. The GPA of the student will not be transferred to the new Department. He/She will however be required to take all the foundation/compulsory courses in the new Department.

2.0 B.SC. DEGREE PROGRAMME

2.1 *Philosophy:*

The Philosophy of the Botany Programme is to equip graduates of Botany with a thorough grounding in modern descriptive and experimental Biology and allied disciplines, and also prepare them for further work in several areas of Botany and related disciplines. The varied course contents in Botany, in addition to exposure to other science-related courses, serve as a foundation for later

courses and by introducing the student to the range of modern botanical science, he/she is equipped to identify and pursue career interests in Science and Technology. The B.Sc. graduate in Botany is thus suited for specialized postgraduate training or specialized work in research institutes, forestry, agriculture, industries, civil service or the teaching profession.

Each student is assigned to a departmental adviser who will counsel and guide him/her in the selection of courses from the pool of prescribed core and elective courses designed to achieve the objectives already stated.

2.2 Degree Offered:

Bachelor of Science (B.Sc.) Degree in Botany.

2.3 Entry Requirements:

Requirements for students intending to obtain the B.Sc. Degree in Botany are those for admission to the University and to the Faculty of Science, except that the qualifying subjects must include credits in Biology or Agricultural Sciences, Chemistry in addition to English and Mathematics at the Ordinary Level of the General Certificate of Education, Senior Secondary School Certificate or its equivalent. Candidates with G.C.E. A/L passes in Chemistry and Botany or Biology may be offered direct entry into Part II of the Degree Programme provided they satisfy the requirements for admission to the University and the Faculty of Science.

2.4 Requirements for the Award of Degree:

The minimum requirement for the award of the B.Sc. Degree in Botany is satisfactory completion of not less than 155 units of course work. Students who are admitted directly into the Part II of the B.Sc. Programme may be exempted from courses adjudged equivalent to the required foundation courses.

Other requirements are those stipulated by the University for the award of first degree under the course unit system.

2.5. Graduation Requirements:

(a) Foundation Programme Option B			Units
BOT	101	Introductory Botany I	3
BOT	102	Introductory Botany II	3
BOT	103	Experimental Botany I	1
BOT	104	Experimental Botany II	1
CHM	101	Introductory Chemistry I	4
CHM	102	Introductory Chemistry II	4
CHM	103	Experimental Chemistry I	1
CHM	104	Experimental Chemistry II	1
MTH	105	Mathematics for Biology Students I	4
MTH	106	Mathematics for Biology Students II	4
PHY	105	Physics for Biological Science I	4
PHY	106	Physics for Biological Science II	4
PHY	107	Experimental Physics 1A	1
PHY	108	Experimental Physics 1B	1
ZOO	101	Introductory Zoology I	3
ZOO	102	Introductory Zoology II	3
ZOO	103	Experimental Zoology	1
Sub-total		=	43

(b)	<i>Special Electives</i>		Units
	Special Electives	=	12

(c)	<i>Departmental Requirements</i>		
BOT	201	Form and Function in Plant	3
BOT	202	Biometry	2
BOT	203	Introductory Genetics	4
BOT	204	Plant Morphology	3
BOT	205	Biological Techniques	2
BCH	202	Cell and Molecular Biology	2
CHM	202	Basic Organic Chemistry	4
CHM	207	Physical and Inorganic Chemistry	4
CHM	205	Experimental Physical and Inorganic Chemistry	1
CHM	206	Experimental Organic Chemistry	1
MCB	201	General Microbiology I	3
MCB	202	General Microbiology II	3
BCH	303	Introductory Biochemistry I	3
BOT	301	Whole Plant Physiology	3

BOT	302	Plant Anatomy I	3
BOT	303	Angiosperm Taxonomy	3
BOT	304	Systematics of Non-flowering Plants.	3
BOT	305	Autecology	3
BOT	306	Evolutionary Processes	2
BOT	307	Plant Tissue Culture	3
BOT	308	Plant Biotechnology	3
BOT	310	SIWES (Students Industrial Work Experience)	2
BOT	407	Field Work	3
FSC	201	Entrepreneurship for Science Student I	2
FSC	201	Entrepreneurship for Science Student II	2
BOT	409/410	Research Project	5
BOT	411	Economic Botany	3
BOT	412	Seminar	1
BOT	417	Environmental Pollution & Conservation Biology	3
CSC	201	Introduction to Computing	3
CSC	202	Introduction to Programming Applications	2
		Sub-total	= 80

(d) *Restricted Electives:* *Units*

A minimum of 15 Units of courses from
the following:

CHM	306	Application of Spectroscopic Methods	3
MCB	302	Pathogenic Bacteriology	3
MCB	310	Mycology	3
MCB	406	Medical Virology	3
PSC	304	Plant Pathology	3
PSC	512	Plant Breeding	3
ZOO	307	Limnology	3
BCH	304	Introductory Biochemistry II	3
BCH	407	Nucleic Acids and Protein Synthesis	3
BOT	401	Plant Metabolism	3
BOT	402	Ecology of Communities and Ecosystems	3
BOT	403	Algae	3
BOT	405	Bryology	3
BOT	406	Plant Growth and Development	3
BOT	408	Plant Anatomy II	3

BOT	415	Advanced Plant Taxonomy	3
BOT	413	Introductory Cytogenetics	3
Sub-total			= 15

(e) *Free Electives*

6 Units of Courses outside those listed in but not equivalent to any in 5 (a - d) above 6

Sub-total	=	6
Grand Total (a+b+c+d+e)	=	156 Units

B.SC. DEGREE PROGRAMME

2.6 Outline of Programme for PARTS I - IV

Course Code	Course Title	SEMESTER	
		Harmattan	Rain
PART I		L T P U	L T P U
BOT 101	Introductory Botany I	3	0 0 3
BOT 103	Experimental Botany I	0	0 3 1
CHM 101	Introductory Chemistry I	3	1 0 4
CHM 103	Experimental Chemistry I	0	0 3 1
PHY 105	Physics for Biological Sciences I	3	1 0 4
PHY 107	Experimental Physics 1A	0	0 4 1
ZOO 101	Introductory Zoology	2	0 3 3
ZOO 103	Experimental Zoology		1
SSC 101	Man in his Social Environment		3
Total =		21	
BOT 102	Introductory Botany II		3 0 0 3
BOT 104	Experimental Botany II		0 0 3 1
CHM 102	Introductory Chemistry II		3 1 0 4
CHM 104	Experimental Chemistry II		0 0 3 1
ZOO 102	Introductory Zoology II		2 0 3 3
PHY 106	Physics for Biological Sciences II		3 1 0 4
PHY 108	Experimental Physics 1B		0 0 4 1
SSC 102	Element of Economic Principle and Theory		3 0 0 3
	Special Electives		2
	Total =		2 2

	PART II		
MTH 105	Mathematics for Biology Students	4 1 0 4	
CHM 205	Physical and Inorganic Chemistry	3 1 0 4	
CHM 207	Experimental Physical & Inorganic Chemistry	0 0 4 1	
BOT 201	Form and Function in Plants	2 0 3 3	
BOT 203	Introductory Genetics	3 0 3 4	
BOT 205	Biological Techniques	2 0 3 3	
CSC 201	Introduction to Computing	2 0 3 3	
	Total =	2 1	
BOT 202	Biometry		2 0 0 2
BOT 204	Plant Morphology		2 0 3 3
BCH 202	Cell and Molecular Biology		2 0 0 2
CHM 202	Basic Organic Chemistry		3 1 0 4
CHM 206	Experimental Organic Chemistry		0 0 4 1
MTH 106	Mathematics for Biology Students II		4 1 0 4
CSC 208	Introduction to Programming Applications		1 0 3 2
	Special Electives		2
	Total =		2 1
	PART III		
BOT 301	Whole Plant Physiology	2 0 3 3	
BOT 303	Angiosperm Taxonomy	2 0 3 3	
BOT 305	Autecology	2 0 3 3	
BCH 303	Introductory Biochemistry I	2 0 3 3	
MIC 201	General Microbiology I	2 0 3 3	
BOT 307	Plant Tissue Culture	2 0 3 3	
	Special Electives		2
	Total =	2 0	
BOT 302	Plant Anatomy I		2 0 3 3
BOT 304	Systematics of Non-Flowering Plants		2 0 3 3
BOT 306	Evolutionary Processes		2 0 3 3
BOT 308	Plant Biotechnology		2 0 3 3
BOT 310	SIWES (Vacation)		0 0 3 2
MCB 202	General Microbiology II		2 0 3 3
	Special Electives		4
	Total =		2 3

	PART IV		
BOT 407	Field work	1 0 6 3	
BOT 409	Research Project	0 0 6 2	
BOT 411	Economic Botany	2 0 3 3	
BOT 417	Environmental Pollution & Conservation	2 0 3 3	
Restricted Elective	Biology.	6	
ZOO 307	(Any two of the following):	2 0 3 3	
BCH 304	Limnology	2 0 3 3	
BCH 407	Introductory Biochemistry II	2 0 3 3	
BOT 401	Nucleic Acids and Protein Synthesis	2 0 3 3	
BOT 403	Plant Metabolism	2 0 3 3	
BOT 405	Algology	2 0 3 3	
BOT 413	Bryology	2 0 3 3	
BOT 415	Introductory Cytogenetics	2 0 3 3	
	Advanced Plant Taxonomy	2	
	Special Elective	1 9	
	Total =		
BOT 410	Research Project		0 0 9 3
BOT 412	Seminar		1 0 0 1
Restricted Electives	(Any 3 of the following):		9
BOT 402	Ecology of Communities and Ecosystems	2 0 3 3	
BOT 406	Ecosystems	2 0 3 3	
CHM 306	Plant Growth and Development	2 0 3 3	
MCB 302	Application of Spectroscopic Methods	2 0 3 3	
MCB 310	Pathogenic Bacteriology	2 0 3 3	
MCB 406	Mycology	2 0 3 3	
PSC 304	Medical Virology	2 0 3 3	
PSC 512	Plant Pathology	2 0 3 3	
	Plant Breeding	2	
	Special Electives	3	
	Free Elective	1 8	
	Total =		

BOT 101 *Introductory Botany I: 3+0+0 (3 Units)* Harmattan Semester

Biology in a modern world: The growth and ways of science. Scientific method. The science of Botany. Why study Botany?

The cell - Structure & Function: Cell theory, Cell components; similarities and differences of animal and plant cells; similarities and differences between eucaryotic and procaryotic cell; Cell division--mitosis, Cell in development--growth, differentiation, integration.

Elementary treatment of genetics; The physical and chemical nature of genetic material; the major historical events in the elucidation of the nature of genetic material; equational and reductional division in cells. Mendelian genetics; human genetics and genetic counselling; genetic engineering and biotechnology.

Plant Physiology - Elementary treatment of the mechanism of movement of materials in and out of the cell, transpiration, plant and mineral nutrition, photosynthesis, respiration; plant growth substances and their functions.

Ecology definition; elementary consideration of biotic and abiotic components, cycling of matter and energy flow. Types of ecosystems. Pollution--water, air, oil pollution, global warming.

BOT 102 *Introductory Botany II: 3+0+0 (3 Units)* Rain Semester

Variety of forms: classification and evolution in the plant kingdom.

Elementary treatment of cryptogams - algae, fungi, bryophytes.

Pteridophytes--their distribution, classification, morphology, reproduction and economic importance. Evolution and significance of the seed habit in the spermatophytes (non-flowering and flowering seed plants).

Elementary treatment of the anatomy and morphology of angiosperms:

Simple and complex tissue systems in roots, stems and leaves. Scope of morphology--external and internal morphology; morphology of plant organs--root morphology and variations; leaf morphology and variations. Morphology of inflorescence and flowers. Fruit morphology and variations.

BOT 103 ***Experimental Botany I*** 0+0+3 (1 Unit)
Harmattan Semester

Brief history of a microscope, various parts of a light microscope, care of a microscope and how to use a microscope. Drawing and labeling of the essential parts of a microscope. Study of simple plant cell: Drawing and labeling of the inner face of a bulb scale of *Allium* (Onion) observed under a light microscope; study of unicellular cells using yeast cells obtained from palm-wine; drawing of the yeast cells under a light microscope. Study of starch grains using tubers; drawing of starch grains under a light microscope; study of colours in plant cells. Variation in organisms: continuous and discontinuous variations. Cellular substances in plants: test for cellulose, lignin, starch and protein. Adaptation of plants to the environment: estimation of seed production in plants.

- BOT 104** *Experimental Botany II* 0+0+3 (1Unit) Rain Semester.
 Use of Microscope. Prokaryotic and Eukaryotic cells: study of a representative member of each group; study of Fungi, Mosses, Club mosses and ferns: study of a representative member of each group. The study of flowers: flowers of typical anthophyta to know their parts. Essential parts of the flowers to be observed under a light microscope. Internal anatomy of a herbaceous dicot stem. The root system of an herbaceous dicot plant. The study of leaf morphology and the use of keys for identification of plants.
- BOT 105** *Introductory Ecology:* (For non-biology majors) 2+0+0 (2 Units) Rain Semester.
 Ecology: its aims, methods and scope; relevance to Nigeria. Natural history and ecology. Population concept in ecology; growth regulation of populations. Habitat and community concepts; forest and savanna habitats; habitat factors--light, humidity, temperature, wind, soil biotic factors. Ecological zones of West Africa. Food chains and webs. Competition: feeding, protective and dispersal adaptation. Plant successions and their influence on animals. The Ecosystem concept. Conservation and pollution.
- BOT 201** *Form and Functions in Plants - Life Processes in Plants:* 2+0+3 (3 Units) Rain Semester. Living and non-living things. Plants and other living things. Structure of plant cells. Structural patterns in plant nutrition: Sources of metabolisms. Uptake of nutrients. Translocation. Inorganic nutrition. Organic nutrition; Photosynthesis, synthesis of other organic substances, Respiration. Elimination of materials. Growth and Development; Pattern of

growth. Growth in multicellular plants. Factors influencing plant growth. Plant growth substances. Reproduction: Asexual and sexual reproduction. Enzymes: Activation energy. Mechanisms of action. Properties, composition, types, factors affecting activity. Interactions amongst organisms: Social and nutritive interactions.

Prerequisite: BOT 101.

FSC 201 *Entrepreneurship for science students I* (2+0+0 (2 Units) Harmattan Semester

The definition of creativity and innovation; The need to study creativity and Innovation; The sources of Innovative opportunities; Creativity and Product development process; Product planning and execution; The market, the target and the consumer; Presentation of creativity ideas; The world of business; Intellectual properties; Basics of planning; Intellectual Property Management and Global Intellectual Property Protection.

FSC 202 *Entrepreneurship for science students II* (2+0+0 (2 Units) Rain Semester

The Characteristics of Entrepreneurship and Success Secret; Business Plan Fundamentals; Business classification and Ownership Forms; Financial Aspects of Running a Small Business; Marketing, Pre-business feasibility analysis and opportunity assessment; Government Policies and Incentives for SME's and Entrepreneurs; Getting started with your business; Exit Strategies.

BOT 202 *Biometry: 2+0+3 (3 Units) Harmattan and Rain Semester*

Purpose and relevance of Biometry. Population and sample frequency distributions. Data gathering and

presentation. Measure of location and dispersion. Probability. Normal Poisson and binomial distributions. Confidence limits. Analysis of variance (ANOVA). Non-parametric tests in lieu of ANOVA: regression and correlation, Analysis of frequencies; contingency and χ^2 - test, T-test, Z-test and F-test. Factorial experiments. Prerequisite: 'O' Level Mathematics.

BOT 203 *Introductory Genetics* 3+0+3 (4 Units) Harmattan Semester

The subject matter of Genetics. Heritable and non-heritable traits. A short history of Genetics. Sexual and asexual reproduction. Chromosome number and structure; chromosomes and genes. Meiosis and mitosis; alternation of generations. The transmission of hereditary character: Mendelism; gene interaction; quantitative genetics. Cytoplasmic inheritance. Sex determination and sex linkage. Probability in Genetics. Linkage and recombination. Genetics of Lower organisms—viruses, bacteria and fungi. The molecular basis of heredity. Introduction to population genetics. Introduction to evolution and its processes.

Prerequisite: BOT 101.

BOT 204 *Plant Morphology* 2+0+3 (3 Units) Rain Semester

General organisation of the angiosperm plant body. Treatment of the variations in the morphology of the root, stem, leaves inflorescences, flowers, fruits and seeds of angiosperm plants. Introduction to plant description and identification.

Prerequisite: BOT 101.

- BOT 205** *Biological Techniques: 1+0+3 (2 Units)* Harmattan Semester
Microscopy, Histological techniques, Photography, Colorimetry, Photometry, Chromatography, Conductometry. Biological illustration, sampling techniques, herbarium techniques.
- Prerequisite: BOT 101.
- BOT 301** *Whole Plant Physiology 2+0+3 (3 Units)* Harmattan Semester
Chemical background; cell structure and function; water relations of cells; cell wall and growth of cell; soil and mineral nutrition; uptake and movement of water; uptake and transfer of solute; translocation of solutes; partitioning and control mechanism; leaves and atmosphere; water loss--transpiration
- Prerequisite: BOT 201.
- BOT 302** *Plant Anatomy I 2+0+3 (3 Units)* Rain Semester
The Plant Cell; cell organelles and their functions. Meristems and cell differentiation. Cell types, mature tissues and tissue system. Secondary growth in plants. The internal structure of the stem, root, leaves, flowers, fruits and seeds of monocotyledonous and dicotyledonous plants. The periderm; its structure and functions. The structure of plant organs in relation to their function and ecological modification. Emphasis to be placed on tissue identification.
- Prerequisite: BOT 204.

BOT 303 *Angiosperm Taxonomy* 2+0+3 (3 Units)
Harmattan Semester
The objectives of Plant Taxonomy and its relevance to human activities. History of plant Classification. Evolution and unit of plant classification; evolution and its significance to taxonomy. Principles and concepts of Plant Taxonomy; classification, nomenclature, identification. Current systems of classification; taxonomic characters; taxonomic literature. Introduction to plant geography. Treatment of selected orders and families of plants (dicotyledons and monocotyledons). Herbarium practice, organisation and management. Introduction to the preparation of local flora. Emphasis will be placed on plant identification, at least, to the family level.

Prerequisite: BOT 204

BOT 304 *Systematics of Non-Flowering Plants* 2+0+3 (3
Units) Rain Semester
Historical survey of the development of ideas and method of approach concerning the systematics of non-flowering plants. Evolution of the earliest plants. Structural organisation, primary classification and relationships of the Thallophyte, Lichens, Bryophyte, Pteridophytes and Gymnosperms. Problems of terrestrial environments. Review of evolution towards the root, stem, leaf and flower of the Anthophyte, Origin of the Anthophyta.

Prerequisite: BOT 101.

BOT 305 *Autecology* 2+0+3 (3 Units) Harmattan Semester
Units of Ecology: environmental factors, population, community, ecosystem, biosphere. Population: growth, interrelations dynamics-Letka-

Velterra equations, differential and difference equations, Estimations of importance: cover, density, frequency, yield. Organism and population relationships: intra-and inter-specific competition: predation, symbiosis (mutualism), commensalism, independence. Measurement of environmental factors and effects of these on populations. The ecological niche overlap, diffuse competition, co-existence, resource shift. Conservation and Pollution,

Prerequisite: BOT 202.

Co-requisite: BOT 303.

BOT 306 *Evolutionary Processes* 2+0+0 (2 Units) Rain Semester

The theory of evolution. Chemical evolution and the origin of life. Sources of variation: mutation, chromosome re-arrangements, hybridization and recombination, changes in chromosome number. Natural selection: modes of selection, polymorphism. Speciation: isolation and genetic drift; isolating mechanisms. Selection pressures and the evolution of weeds, pests and pathogens. The wild relatives of crops and domesticated animals.

BOT 307 *Plant Tissue Culture* 2+0+3 (3 Units) Harmattan Semester

Techniques of plant tissue culture. Meristem culture. Embryogenesis and organogenesis. Isolation, culture and fusion of protoplasts from higher plants. Applications of plant tissue culture--somatic hybridization, production of haploids, induction of genetic variability, conservation of germplasm.

Prerequisite: BOT 201 and BOT 203

BOT 308 *Plant Biotechnology* 2+0+3 (3 Units) Rain Semester

Review of methods of plant biotechnology. T₁ plasmid. Recombinant DNA and transgenic plants. Introduction of genetic information into plant protoplasts. Continuous culture of plant cells. Secondary products and biotransformation. Nitrogen fixing association of Rhizobia and tissue culture. Applications of biotechnology--plant protection (herbicide resistance, insect resistance, disease resistance, plant products (biofuels, biofertilizers and other products); virus free plants through tissue culture.

Prerequisites: BOT 203, 307.

BOT 310 **SIWES** (Student Industrial Work Experience Scheme)

Horticulture (Recreational horticulture, floriculture). Afforestation (FRIN, NCRI, NACGRAB, NIFOR, NIHORT). Conservation sites (Forest Reserves, National Parks); Biosphere Reserve (National Parks Management Board). Aquatic Environment. Students are free to choose from any of the above-recommended areas of study. The exercise may be carried out during the vacation period for Part III going to IV students.

MODALITY: All Lecturers should be involved in the supervision of SIWES.

BOT 401 *Plant Metabolism* 2+0+3 (3 Units)Harmattan Semester

Photosynthesis: historical development. Chlorophylls and accessory pigments. Reduction of dye and NADP. Evolution of oxygen. Photophosphorylation. ATP hydrolysis. CO₂ fixation. Bacterial photosynthesis. Respiration.

Structure of mitochondria. Glycolysis. Decarboxylation. Oxidative phosphorylation. Special oxidations. Nitrogen metabolism: Nitrogen fixation. Synthesis of amino groups. Secondary metabolism: alkaloids, flavonoids, steroids, Metabolic regulation.

Prerequisites: BOT 301, BCH 303.

BOT 402 *Ecology of Communities and Ecosystems* 2+0+3 (3 Units) Rain Semester
Community interacton. Succession. Species diversity and indices of diversity. Vegetation zones of West Africa, their climatic and edaphic features, their floral and fauna composition. Sampling and collection methods in the study of communities, ecosystems. Energy and materials flow, cycling. Correlation and regression. Introduction to multivariate analysis. Ecosystem description, evaluation; management problems.

Prerequisite: BOT 305.

BOT 403 *Algology* 2+0+3 (3 Units) Harmattan Semester
Primary algal classification. Structure, reproduction and life-histories of the algae with special reference to the Cyanophyceae, Chlorophyceae, Bacillariophyceae, Rhodophyceae and Phaeophyceae. Ecology of terrestrial and freshwater algae.

Prerequisite: BOT 304.

BOT 405 *Bryology* 2+0+3 (3 Units) Harmattan Semester
Structure, reproduction and life-history of the bryophytes: the protonema, metophyte and sporophytes. Spore dispersal mechanisms. The three classes of bryophytes--Hepaticae,

Anthocerotae and Musci. Taxonomic characters and bryophyte identification. Treatment of selected families with special reference to tropical bryophytes.

Prerequisite: BOT 304

BOT 406 *Plant Growth and Development* 2+0+3 (3 Units) Rain Semester Principles of regulation: dynamic relation between internal chemical genetical factors and external environment. Plant response as a result of this dynamism, at level of cell differentiation and morphogenesis. Periodicity in plant response short period or circadian rhythms. “Biological clock” concept, Bunning’s hypothesis. Long-period rhythms-flowering and dormancy: temperature, light, moisture effects. Plant growth substances: auxins, gibberellins, cytokinins, abscisic acid, ethylene; inhibitor systems.

Prerequisites: BOT 203, BOT 301 and BCH 303.

BOT 407 *Field Work* (3 Units) Harmattan and Rain Semester Floristic description of vegetation types. Impact of human activities on vegetation; Afforestation, Field report .

Prerequisites: BOT 201, BOT 303 and BOT 305

BOT 408 *Plant Anatomy II* 2+0+3 (3 Units) Rain Semester The structure and properties of the cell wall. Bark and Wood anatomy. Structure of the secondary xylem and wood identification Secondary growth in plants. Ecological Plant anatomy. Meristems and morphogenesis in plants. Applied Plant Anatomy. Prerequisite: BOT 302.

BOT 409/410 *Research Project* (5 Units) Harmattan/Rain Semester

Upon the advice of the student's adviser and with the consent of the Head of Department, the student may engage in an honours project in any area of Botany for which suitable supervision and facilities are available. The project will consist of directed reading, tutorial discussion with the supervisor of the project (assigned by the Head of Department) and independent research work.

Prerequisites: Consent of the Head of Department.

BOT 411 *Economic Botany* 2+0+3 (3 Units) Harmattan Semester

Importance of Plants to Man. Cultivated Plants, their wild relatives and centres of origin. Inventory, botanical characteristics and cultivation of economic plants. Utilization of plants. Investigations of uses of indigenous plants (Ethnobotany). Plants and world energy supply. Deforestation, devegetation and desertification. Conservation of germplasm.

Prerequisite: BOT 303.

BOT 412 *Seminar* (1 Unit) Rain Semester

Students are to participate in departmental seminars throughout the session. Each student will present a seminar on an assigned topic or his/her research project.

Prerequisite: Consent of the Head of Department.

BOT 413 *Introductory Cytogenetics* 2+0+3 (3 Units) Harmattan Semester

The subject matter of Cytogenetics, genophore, genetic material in protocell and eucells. The

Eukaryotic Chromosomes, physical and chemical structure, heterochromatin and euchromatin, special types of chromosomes. Cell division: mitosis, meiosis, gametogenesis. Crossing over and chiasmata formation: factors affecting, cytological basis of; chromosome rearrangements: duplications, deficiencies, inversions, translocations; chromosome aberrations and evolution. Changes in chromosome number: euploidy and aneuploidy, polyploidy and evolution. Evolution of sex-determining mechanisms: balance theory of determination, chromosomal mechanisms, genic mechanisms, other systems. Chromosomes in biotechnology, whole Chromosome manipulations in plant breeding, gene cloning and prospects in plant improvement, somatic hybridization, tissue culture techniques.

Prerequisite: BOT 203.

BOT 415 *Advanced Plant Taxonomy* 2+0+3 (3 Units)

Harmattan Semester

The herbarium and scientific research. Detailed treatment of the principles of classification, nomenclature and identification. Review of contemporary taxonomic systems. Taxonomic data; their extraction, analysis and interpretation. Evolution and taxonomy. Sources of variation in plants. Further treatment of selected families of plants. Intensive practice on plant description and identification. There will be a mini-project on herbarium practice and preparation of a local flora.

Prerequisite: BOT 303.

BOT 417 ***Environmental pollution and conservation biology***

2+0+3 (3 Units) Harmattan Semester

Description and classification of causes of pollution of air, water, land and food; oil pollution. Acidification of the environment. Elementary treatment of some detection methods--use of biological indicators, biomonitors, bioaccumulators, biomarkers, bioprobes. The physiological effects of pollutants. Effects of pollutants on population of plants in water and on land. The Principles and methods of controlling atmospheric and water pollution. Climatological and legal aspects of pollution. Conservation: definition, natural resources--renewable and non-renewable--biodiversity. Conservation strategies: in-situ and ex-situ: biosphere reserves etc. Legislation on endangered species. Agencies involved in conservation activities.

2.8 **PRIZES IN THE DEPARTMENT**

Professor E. A. Odu Prize in Bryology - To be awarded to the graduating student in Botany who scores the highest grade in BOT 405 (Bryology) and whose class of degree is not less than Second Class Honours (Upper Division).

Professor O. T. Ogundipe Prize in Botany - To be awarded to the best graduating student in Botany.

3.0 POSTGRADUATE PROGRAMME

3.1 Introduction

The Department of Botany is at present equipped to offer post-graduate training in Botany with emphasis in any one of the following specializations: Plant Physiology, Ecology, Genetics, Cytogenetics, Plant Taxonomy, Bryology, Algology, and Pteridology.

3.2 Degree Awarded

M.Sc. and Ph.D in the fields listed above.

3.3 General Requirements

General entrance and course requirements are as set forth by University and Faculty regulations.

3.4 General Departmental Requirements

Candidates must hold a B.Sc. degree which represents work including general courses of their equivalents in Biology, Botany, Ecology, Genetics, Agriculture or forestry.

3.5 Course Work

(a) General Plan

The programme of study for the Master of Science degree is of minimum of twelve months continuous residence. Approximately the first eight months are spent in course work research, while the four months are devoted to intensive research, analysis and the preparation of a dissertation.

The course load required of all candidates is from 24 units. Of these, at least 15 units must be taken from the department. Courses equaling 9 units may be selected from courses outside the Department or Faculty, always upon the recommendation of the supervisor and approval of the postgraduate college. The thesis (6 units) is required of all candidates and Seminar is also required.

(b) *Course Requirements*

- (i) Courses are listed below, arranged according to area of degree specialization. Not all courses will be offered every year: those available will depend upon staffing and the current research programme of the department.
- (ii) Several of the courses will be offered in association with other Departments and Faculties of the University.
- (iii) To qualify for an M.Sc. degree in Botany a candidate must take at least 24 units of study as follows:

Compulsory Courses are BOT 601 and 602 - 5 units

Selected Courses mainly chosen from

BOT 603 - 622 - 13 units

BOT 623 - Thesis. - 6 units

- (iv) *Course Requirements* for Ph.D. Degree

As for M.Sc. plus at least two years of research leading to the thesis. He must present a seminar on his research work.

c. Courses

Course No.	Course Title	Units
BOT 601	Seminar in Botany	2
BOT 602	Special Research Techniques in Botany	3
BOT 603	Comparative Plant Anatomy	3
BOT 604	Developmental Plant Anatomy	3
BOT 605	Mineral Nutrition of Plants	3
BOT 606	Water Relations in Plants	3
BOT 607	Growth and Developmental Physiology of Plants	3
BOT 608	Plants	3
BOT 609	Primary Metabolism of Plants	3
BOT 610	Conventional Taxonomic Techniques	3
BOT 611	Experimental Methods in Taxonomy	4
BOT 612	Critical Studies in Nigerian Flora	3
BOT 613	Forest and Savanna Ecology	4
BOT 614	Bryophyte Ecology	3
BOT 615	Statistical plant Ecology	3
BOT 616	Special Research Techniques in Ecology	3
BOT 617	Weeds and Colonisers	3
BOT 618	Ecology of Epiphytes	3
BOT 619	Physiological plant Ecology	3
BOT 620	Advanced Cytogenetics	3
BOT 621	Radiation Genetics in plants	3
BOT 622	Genetics of Weeds and pests	3
BOT 623	Evolutionary Mechanisms	6
	Dissertation in Botany	

3.6 Examinations

(a) M.Sc.

Each course will be examined at the completion of the course and all such examinations will be completed within nine months from the time the candidate came into residence. A thesis based on original research work and written in accordance to the regulations stipulated by the postgraduate college of the Obafemi Awolowo

University must be presented by the candidate at the end of twelve months of residence. The thesis will be assessed in accordance with University and Faculty regulations.

(b) *Ph.D.*

The Ph.D. degree shall require not less than 4 semesters of full-time study and will be subject to general and special regulations laid down by the University and Faculty. The candidate will be expected to devote most of his time to research, at the end of which he shall present a thesis; the thesis shall be examined according to the regulations prescribed by University and the Faculty.

3.7 Staff for Graduate Programmes

See the list of staff for the undergraduate programme. All lecturers from the grade of Lecturer I can teach post-graduate courses. While Senior Lecturers and above can supervise both M.Sc. and Ph.D programmes, a Lecturer I can only supervise M.Sc.

3.8 Course syllabus

BOT 601: Seminar in Botany 2 units. Fortnightly

Directed readings in Botany. Seminars led by staff members and visiting scientists on current topics of botanical research.

**BOT 602: Special Research Techniques in Botany 3 units
0+2+3**

Practical work with accompanying lectures where necessary on the basic techniques used in the modern investigations of problems in various aspects of Botany.

BOT 603: Comparative Plant Anatomy:

A review of the patterns of variation of anatomical features and their contribution to taxonomy and evolution. In-depth treatment of epidermal structures and wood anatomy of some critical

groups of plant. Other applications of anatomical information to such areas as environmental studies, drug research, forest products, weeds and animal feed analysis.

BOT 604: Development Plant Anatomy

A review of the patterns of growth in plants. Apical meristems, the shoot and root apices, organization and experimental investigations. The initiation and development of leaves and buds; phyllotaxis, stomatogenesis. The vascular cambium: differentiation and origin of procambium; cambial growth and periodicity of cambial growth. Differentiation of primary and secondary vascular tissues. Differentiation in roots. Floral anatomy; initiation and development of the flower.

BOT 605: Mineral Nutrition of Plant 3 units. 0+2+3

Mechanics and kinetics of minerals uptake and transport. Utilization and mode of action of minerals. Mineral deficiency and toxicity. Nitrogen fixation and nitrification. Nitrogen metabolism. Anthocyanin biosynthesis in relation to mineral nutrition.

BOT 606: Water Relations in Plants 3 units. 0+2+3

Water relations considered at organismal and cellular level with particular reference to the tropics and tropical plants.

BOT 607: Growth and Developmental Physiology of plants 3 units 2+0+4

Plant growth--cell division. Differentiation and correlative development. Current concepts and mode of action of plant hormones. Recent advances in the general field of growth and developmental plant physiology.

BOT 608: Primary Metabolism of Plants 3 units. 2+0+4
Photosynthesis and carbon dioxide fixation. Photosynthesis and the entrance of energy into the cell. Respiration--energy storage, utilization and loss. Recent advances in the area of photosynthesis, respiration and nitrogen metabolism.

BOT 609: Conventional Taxonomic Techniques
A course designed to prepare students to take effective responsibility for developing functional teaching and research herbaria--is a thorough treatment of Angiosperm systematics; procedures for the preparation of first-class herbarium material, special training in the effective use of keys and other procedures for plant identification and in the construction of improved keys for large groups of highly critical plants. Herbarium administration and training of junior staff.

BOT 610: Experimental Methods in Taxonomy 3 units. 0+2+4
A course surveying how the fields of anatomy, genetics, phytochemistry, phytogeography, palynology and multivariate analysis may be applied with advantages to taxonomy, with in-depth consideration of one or more areas. Emphasis on working with living materials sometimes under experimental growing conditions, and on methods for the object recognition of taxa independent of previously accepted views.

BOT 611: Critical Studies in Nigerian Flora units. 0+2+4
An intensive investigation into the taxonomy and ecology of a critical group of plants, vascular or non-vascular.

- BOT 612: Forest and Savanna Ecology 4 units.** 0+3+5
Survey of vegetation types of West Africa and critical evaluation of such zonal classifications; alternative approaches. Survey of animals found in such vegetation types, their habitat adaptation and food relationships; methods of animal collection. Field work in wet southern forest, derived savanna, northern Guinea savanna, with emphasis on the types of problems encountered in assessment of abundance of plants and animals, characterization of environment, description and comparison, productivity estimation and ecosystem modelling.
- BOT 613: Bryophyte Ecology 3 units.** 1+1+3
Review taxonomy of West African bryophytes. Life forms. Seasonality of growth and reproduction. Water and nutrient relations; temperature responses of bryophytes. Problems of attachment to the substratum. Bryophytes as sensitive indicators of atmospheric pollution.
- BOT 614: Statistical Plant Ecology 4 units.** 1+2+3
Data collection, cleaning, coding; information retrieval. Significance testing. Multiple and partial correlation and regression. Classification, clustering, ordination and Principal Components Analysis. Ecosystem modelling and Systems approach to ecological problems.
- BOT 615: Special Research Techniques in Ecology 3 units.** 0+2+3
The precise content of the course will vary according to major needs of Ecology degree candidates but will always include basic work in environmental measurements and recording of climatic variables; remote sensing; plant, animal, habitat census and survey.

- BOT 616: Weeds and colonizers 3 units. 1+1+4**
Principles of weed ecology and physiology, distribution, population growth, competition. Taxonomy of Nigerian weeds.
- BOT617: Ecology of Epiphytes 3 units. 1+1+3**
Survey of major epiphyte groups with special emphasis on the vascular plants. Ecological and physiological problems associated with the epiphytic way of life. Contribution of epiphyte studies to general ecology.
- BOT 618: Physiological plant Ecology 3 units 1+2+0**
In-depth consideration of the physiological aspects of plant-animal-physical/chemical environment relationships. Emphasis is placed on field problems such as productivity limitations and environmental stress.
- BOT 619: Advanced Cytogenetics 3 units. 2+0+3**
Evolution of genophores. Chromosome structure and function. Supernumerary chromosomes. Meiotic and mitotic crossing over. Genes and chromosomes. Evolution of karyotype. New approaches to karyotyping. Structural changes in chromosomes--duplications and deficiencies, inversions and interchanges with emphasis on their evolutionary significance and their applications in gene-mapping. Balanced lethal systems (Oenothera cytogenetics, ClB and similar systems). Polyploidy: types, genetic behaviour, characteristics, evolutionary significance and induction of autopolyploidy and allopolyploidy. Applications of polyploidy. Origins, terminology, breeding behaviours and genetic ratios in aneuploids. Evolution of sex-determining mechanisms.

BOT 620: Radiation Genetics in plants 3 units 2+1+0
Comparison of spontaneous and induced mutations. Mutation, selection and population fitness. Types of ionizing radiation and their cytogenetic effects. Effects of pre-irradiation and post-irradiation. Factors modifying irradiation of successive generations. Spontaneous and induced mutations in vegetatively propagated species. Methods of utilizing induced mutations in crops improvement.

BOT 621: Genetic of Weeds and Pests 3 units. 2+0+3
The evolutionary and economic implications of weeds as the vegetation of the future. The interaction of genetic variability and environmental variability in evolution. Anthropogenic factors in the evolution of weeds. The weed-crop ecosystem and weed-crop co-evolution; weeds as alternate hosts to crop pests--the evolutionary-genetic angle. Modes of weed evolution; mutation, chromosome re-arrangements, aneuploid changes, polyploid changes; polyploidy and hybridization. Genetic and cytogenetic modes of weed evolution; examples from Nigeria-occurring Gramineae and Compositae; other examples. Weedy relatives of cultivated plants; *Manihot*, *Oryza*, *Sorghum*, *Dioscorea* etc. Prospects for genetic control of weeds. Pattern of adaptation and genetic variation in insects. The problems of heritable resistance to insecticides. Genetic control of pests: chemosterilization and male -sterile techniques. Speciation in tropical environments.

BOT 622: Evolutionary Mechanisms 3 units. 2+0+3
The synthetic theory of evolution and its development. The sources of variability. The nature of mutation, its causes and adaptiveness. The organization of genetic variability. The

differentiation of population. Reproductive isolation and the origin of species. The role of hybridization and polyploidy in evolution. Major trends of evolution.

BOT 623: Thesis in Botany 6 units.

4.0 AREAS OF ACTIVE RESEARCH

Plant Physiology and Biotechnology

Active research is going on in the area of tissue culture of our crop species and our indigenous germplasm sources. The objective is to provide baseline information on the propagation and improvement of our indigenous species.

Ecology

Work is ongoing on the dynamics of succession in the tropical rain forest; there are also intense studies of tropical forests--their structure and floristic composition with the aim of conserving forest vegetation to combat erosion encroachment.

Work is also ongoing on primary production, nutrient cycling and human impact on the vegetation in the savanna ecosystem.

Systematics and Anatomy

Baseline work is ongoing on the anatomical (foliar, wood anatomy) survey of Nigerian plant species. Conventional taxonomic techniques including palynology and electrophoretic studies are also used in fine-tuning the taxonomy of major groups of our flora.

Genetics & Cytogenetics

Active work is ongoing on the genetic, cytogenetic and cytotaxonomic studies of our grasses, legumes, compositae and other groups. This work involves cultivated crops and their wild relatives--sorghum, rice, cowpea--and the focus is on their population dynamics, hybridization studies, reproductive biology and genetics of characters of agrobotanical value.

Lower Plant (Algology, Bryology)

Work is ongoing on bryophyte ecology, bryophyte taxonomy, bio-indicators of environmental pollution and antimicrobial activities of lower plants.