

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



**FACULTY OF PHARMACY**

**HANDBOOK  
2019- 2021**

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- The Calendar (Published biennially)
- The University Gazette (Published annually)
- The Faculty/Postgraduate Handbooks (Published biennially)
- University Annual Reports.

## **CORRESPONDENCE**

*General* - The Registrar  
*Finance* - The Bursar

## OFFICERS / STAFF OF THE FACULTY

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*\*Non-tenured one-year appointment*

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## **DEPARTMENT OF PHARMACEUTICAL CHEMISTRY**

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*Senior Lecturer & Ag. Head*  
*Professor*  
*Professor*  
*Professor*  
*Senior Lecturer*  
*Senior Lecturer*  
*Lecturer I*  
*Lecturer II*  
*Lecturer II*  
*Junior Training Fellow*  
*Senior Technologist*  
*Snr. Technical Officer*  
*Senior Laboratory Superintendent*  
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*Snr. Lab. Attendant*  
*Confidential Secretary I*  
*Chief Secretarial Assist.*  
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*Lecturer II*  
*Chief Technologist*  
*Chief Technologist*  
*Senior Assist. Technician*  
*Snr. Assist. Technologist*  
*Snr. Lab. Superintendent*  
*Snr. Lab. Superintendent*  
*Laboratory Supervisor*  
*Laboratory Attendant*  
*Chief Secretarial Assist.*  
*Chief Secretarial Assist.*  
*Senior Office Assistant*

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O. A. Osunmakinde

*Senior Research Fellow &*  
*Acting Director*  
*Professor*

*Senior Research Fellow*

*Senior Research Fellow*

*Research Fellow I*

*Research Fellow I*

*Research Fellow I*

*Research Fellow II*

*Snr. Lab. Technologist*

*Med. Lab. Technologist I*

*Senior Lab. Superintendent*

*Senior Lab. Assistant*

*Principal Exec. Officer II*

*Chief Secretarial Assistant*

*Secretarial Assistant I*

*Chief Garden Attendant*



## 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. 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. 112 of 1975 (Transitional Provisions) Decree No.23 of 1975. This new Decree effected a takeover of the Obafemi Awolowo University by the Federal Military Government thus became the sole owner of the University 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 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 Technology and Health Sciences (now College of Health Sciences) (both established on 1st October, 1960), Faculty 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 following other Institutes and major units exist in the University:

- The Adeyemi College of Education located in Ondo
- The Institute of Agricultural Research and Training, Ibadan
- 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
- Centre for Gender and Social Policy Studies
- Centre for Distance Learning
- Entrepreneurship and Development Studies (IFEDS)
- Obafemi Awolowo University Investment Company Limited

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

- African Regional Institute for Geospatial Information Science and Technology (AFRIGIST) formerly RECTAS
- The National Central for Technology Management
- The Centre for Energy Research and Development
- The African Regional Centre for Space Science and Education in English.

The student population has rising steadily from 244 in 1962/63 to over 30,000 at present.

## **Mission, Vision, Major Thrusts of the University**

### **Mission**

To nurture a teaching and learning community; advance frontiers of knowledge; engender a sense of selfless public service; and add value to African culture.

### **Vision**

A top rated university in Africa.

The **major thrusts** of the University Strategic Plan for 2016 – 2020 are:

- Teaching,

- Research and Innovation,
- Governance,
- Fund Generation and Management,
- Human Resources Development and
- Infrastructure and Estate Development.

These major thrusts involve the following broad objectives:

- The modernisation of the University's teaching programmes, through a continuous review of the curricula and teaching support services
- The pursuit of a research agenda that will deepen the University's contribution to national development through research outputs and products uptake,
- The preparation of students for self-employment and entrepreneurship.
- The continued development and expansion of Information and Communication Technology (ICT) for all aspects of the institution's functions.
- An expanded revenue base backed by improved financial management capability.
- The development of strategic linkages and partnerships

## **BRIEF HISTORY OF THE FACULTY**

Pharmacy was first established as a Department in the former Nigerian College of Arts, Science and Technology, Ibadan Branch, in the year 1957. When the University of Ife (now Obafemi Awolowo University) was established in 1962, it remained a Department within the Faculty of Science. It, however, continued to award Diploma in Pharmacy till June 1965 while concurrently a programme for the B. Pharm. degree was started in September 1963.

The Senate of the University decided during the 1968/69 session to upgrade the Department into a full Faculty status from 1st October, 1969, with four main departments: Pharmaceutical Chemistry, Pharmacology, Pharmacognosy and Pharmaceutics. Consequently, the growth of the Faculty continued at the Ibadan Campus of the University until it transferred to her present building on the Ile-Ife (home) campus in September 1972.

The Faculty over the period of its growth and development had three units namely, Drug Research Unit, Pilot Drug Production Unit and Drug Quality Control Unit which were incorporated into the Departments of Pharmacognosy, Pharmaceutics and Pharmaceutical Chemistry, respectively. However, during the 1978/79 session the three units were separated from the Departments and merged into a Unit, now known as the 'Drug Research and Production Unit', to consolidate the various efforts on research in the Faculty. Senate approved in 1983 that this Unit should become an autonomous department in the Faculty of Pharmacy. The department of Clinical Pharmacy and Pharmacy Administration was physically and effectively established in November 1996 and has since then been functioning as a full department.

There are currently in the Faculty the following five academic departments and one Unit:

- Department of Clinical Pharmacy and Pharmacy Administration
- Department of Pharmaceutical Chemistry
- Department of Pharmaceutics
- Department of Pharmacognosy
- Department of Pharmacology
- Drug Research and Production Unit

The Faculty also has established postgraduate programmes in all her departments and Unit. The staff development programme of the University contributed immensely towards the availability of Teaching and Research in the Faculty of Pharmacy.

# OFFICERS OF THE UNIVERSITY

## Visitor

His Excellency, Mohammadu Buhari, *GCFR*  
*President and Commander-in-Chief of the Armed Forces,*  
*Federal Republic of Nigeria*

## Chancellor

His Royal Majesty, Alhaji (Dr.) Yahaya Abubakar  
*D. Litt., (Honoris Causa) (Ife), D.C.L*  
*ETSU Nupe*

## Pro-Chancellor and Chairman of Council

Dr. Yemi Ogunbiyi *B.A. (Ibadan), M. A., PhD (NYU)*

## Vice-Chancellor

Prof. E. O. Ogunbodede *B.Sc., B.Ch.D. (Ife), MPH (Lagos), DDPH RCS (England),*  
*FFD RCS (Ireland), PhD (UWC)*

## Deputy Vice-Chancellor (Academic)

Prof. A. S. Bamire *B. Agric., M.Phil., PhD*

## Deputy Vice-Chancellor (Administration)

Prof. C. O. Ajila *B.A., M.Ed., PhD*

## Registrar

Margaret I. Omosule, *B. A., M.A. (Ife); MNIM, MANUPA*

## Librarian

Dr. F. Z. Oguntuase *B.Sc., M.Sc., PhD*

## Bursar

S. O. Ayansina, *B. Sc. (LCU, Ibadan), MPP (Ibadan), M. B. A. (Ibadan), ACIT, FCA*

## **ESTABLISHMENT OF THE UNIVERSITY COUNCIL**

The Federal Government exercises control over the University by appointing members of the Governing Council (except Ex-Officio members), which formulates broad policies for the smooth administration of the University. In addition, the Federal Government appoints the Chancellor for the University, who presides at all convocation ceremonies when he is present. Also, matters pertaining to the general well-being of the University are brought to his attention.

The Head of State, Commander-in-Chief of the Armed Forces of the Federal Republic of Nigeria is the Visitor to the University and has the power to appoint Visitation Panels for the University, as he deems necessary. More specifically however, the Federal Government exercises control over the University through the National Universities Commission and the Federal Ministry of Education.

The Council is the supreme governing organ with control in particular over the financial and property affairs and the staffing of the University. All contracts binding the University and staff appointments are made in the name of the Council. The functions of the Council are spelt out in greater details in the University of Ife Edict No. 14 of 1970 Section 15. After stating that the Council shall be the governing authority of the University, the law empowers it to authorize establishments for the academic, the administrative and other staff in the University, and to suspend or abolish posts other than those created by the Law or the Statute. Subsection 3(e) of the same Law empowers the Council to remove from office and discipline all categories of University staff. The Council is supreme over financial matters and general superintendence of policies and property, such matters include approval of the annual university budget, acquisition of property, award of contracts, maintenance of accounts and investments, and investing monies on behalf of the University.

The composition of the membership of Council is contained in Statute 10(1) as amended by Decree No 11 of 1993 and Decree 25 of 1996.

- (a) Ex-Officio Members:     The Pro-Chancellor,  
                                           The Vice-Chancellor  
                                           The Deputy Vice-Chancellors
- (b) 1 member from the Federal Ministry of Education
- (c) 4 members appointed by National Council of Ministers
- (d) 4 members of Senate appointed by Senate

- (e) 2 members of the Congregation elected by the Congregation
- (f) 1 member of the Alumni Association elected by the Alumni Association.

### **Organization and Administration**

The Organizational structure of the University is as shown on pages 18-19. The Vice-Chancellor is the Chief Executive 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/she assists the Vice-Chancellor in the day-to-day administration of the University. He/she 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 Directorate 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's Central Administration also includes some Units providing essential 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.

The University Statutes establish other bodies with their own defined powers. One of them is Senate. The functions of Senate are contained in Section 16. The Senate shall subject to the provisions of this Edict and subject also to the powers reserved to the Council in all matters affecting the finances of the University, be the **supreme academic authority of the University**, and be responsible for all academic matters in the University, and shall organise, control and direct the academic work of the University, both in teaching and research, and shall take such measures and acts in such a manner as it thinks proper for the advancement of the University as a place of educational learning and research. It is the responsibility of Senate to direct, regulate, the instruction, teaching and courses of study within the University; to award degrees (other than Honorary degrees) Diplomas, Certificates and other academic titles and distinctions etc., to regulate all university examinations, etc.

Statute 12 names the membership of Senate thus:

- (a) The Vice-Chancellor, who shall be the Chairman;
- (b) The Deputy Vice-Chancellors;
- (c) The Professors of the University;
- (d) The Librarian of the University;
- (e) The persons for the time being holding such appointments on the academic staff of the University as may be specified by the Vice-Chancellor.
- (f) Twelve full-time members of the academic staff of the University elected by congregation other than those mentioned in sub-paragraph (a) to (e) of this paragraph, elected by the Congregation.

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 organisation 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 the 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 disciplines that require interdisciplinary research efforts and thus, cut across Faculties in scope.

### **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 recognised university. It discusses and declares an opinion on any matter whatsoever relating to the wellbeing of the University. It has twelve elected members in Senate and two elected members in the University Council.

# INFORMATION ON FACILITIES

## UNIVERSITY LIBRARY (Hezekiah Oluwasanmi Library)

### Plan of the Library

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

### 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, while 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.

### The Library Collection

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

- (i) The Undergraduate Areas, and
- (ii) The Research Areas

#### 1. Serials Collection

The Serials collection consists of

- (a) Current journals, the most current issue of which are shelved in the display section of the Serials Room.
- (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 batch.
- (c) Latest back file i.e. the latest 10 years of journals which are on open access to registered senior staff and postgraduate students.

#### 2. Africana Special Collection

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

### 3. **Library Online Services**

- (a) You can access the Library directly through the URL <http://library.oauife.edu.ng> or <http://62.173.43.75/>
- (b) You can search the Library's Online Public Access Catalogue (OPAC)
- (c) You can search the Library's Online Databases such as EBSCOHOST, JSTOR, HINARI, AGORA, etc.

### 4. **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 Africa governments and International organizations. The collection is closed access.

### 5. **Reference Collection**

Dictionaries, encyclopaedia, 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 materials are also kept in the Reference Room. Cards indexes to these collections are provided and all requests for materials from them should be made at the Reference Desk. In addition, indexes are provided to periodical articles on Nigeria and on African literature.

### 6. **Reserve Collection**

#### (a) **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 of the North wing East.

#### (b) **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.

### 7. **Recent Accessions**

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) ₦5.00 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 ₦10.00 per day after the third day from the date of recall.
- (c) Books lost or damaged will attract a fine of 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.

## **B. DIVISION OF STUDENTS' AFFAIRS**

### **1. Guidance and Counselling Unit**

The Division of Students Affairs has professional Counsellors who are committed to helping students grow in self-understanding in the process of integrating their personal and academic experience. 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 counselling, group counselling, study skills improvement, tests anxiety reduction, personal crisis intervention, psychological testing, career and occupational counselling 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 satisfactorily.

The Counsellors can be contacted in Rooms 9 and 10 of the 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 Student's 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 advertisement and other relevant information. Liaison is also maintained between students and governments at various levels for scholarships and bursaries.

## **INSTITUTION OF ROLL OF HONOURS FOR STUDENTS**

Senate at a Special Meeting held on Wednesday, 1<sup>st</sup> November, 2006 decided that Roll of Honours for Students be instituted in the University to embrace discipline and good performance among students 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 GPA of 4.0 for Departmental Honours Roll; 4.25 for Provosts/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 beneficiary 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:
  - (a) Departmental Honours - Departmental Notice Board
  - (b) Provost/Deans Honours - Faculty Notice Board
  - (c) University / Vice-Chancellor Honours - Secretariat Building
- (xi) Each beneficiary shall be given a certificate

## **UNIVERSITY EXAMINATION REGULATIONS**

### **REGISTRATION FOR UNIVERSITY EXAMINATION**

- (a) A candidate for University examination must have registered for 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 the 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 fails to take an examination he would be scored “O F” 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 or courses to offer in a particular semester shall is expected to apply for leave of absence.
- (d) A candidate who has less than 15 units, to graduate in a particular semester shall 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 a 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 shall be routed through the Head of Department.

- (f) Students must attend a minimum of 75% of course instructions including lectures, tutorials and practical classes, where required, to qualify to sit for examination in any course.
- (g) A candidate for a University examination in a particular degree programme should not be a regular candidate for another degree in this or any other university concurrently. Any candidate so discovered shall forfeit his/her studentship.

### **ABSENCE FROM EXAMINATION**

Candidates must present themselves at such University examinations for which they have registered. Candidates who fail to do so for reasons 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 shall be deemed to have scored “O F” in the minimum number of units required for a full-time student (i.e. 15 units).
- (b) Candidates who registered for courses, attended classes regularly, did all practical exercises and tests but did not take the required Semester examinations shall be given a continuous assignment grade in each of the affected courses and a grade of “O” 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 shall be deemed to have scored “O F” 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 shall first report to the Director, Medical and Health Services before attending any hospital outside the University. A report of sickness shall be made to the Registrar within a week and a medical certificate for 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

report submitted outside this period, shall be considered on its own merit.

- (iv) The Director of Medical and Health Services shall within 48 hours submit a medical report on a candidate who falls 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 of Medical and Health Services. All applications for Leave of Absence must be taken by the appropriate Faculty Board.

## **EXAMINATION OFFENCES AND PENALTIES**

### **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 an 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. The candidate impersonated shall also be liable of an infraction of this regulation where it is established directly from circumstantial evidence that the impersonation is with his knowledge or connivance.
- (c) No candidate shall take into an examination room, or have in his possession during an examination any book or paper or printed or written documents, whether relevant to the examination or not, unless specifically authorized to do so. An 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 directions 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 be not permitted in the 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 examination 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 invigilator's 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 as misconduct.
- (n) Where the Vice-Chancellor is satisfied on the basis of the reports forwarded to him that any candidate has a case to answer, he shall refer the case to the Central Committee on Examination Malpractice.

### **Penalties for Examination Malpractices and other Offences**

- (a) Any examination offence would attract appropriate penalty including outright dismissal from the University.
- (b) Where the Vice-Chancellor has reason to believe that the nature of any question or the content of any paper may have become known before the date and time of the examination to any person other than the examiner of the paper, the Board of Examiners, and any official of the University authorized to handle the paper, he may order the suspension of the examination or the cancellation of the paper or setting of a new paper and shall report the matter to the Senate. The Vice-Chancellor shall also take any disciplinary measure against any student or students involved as he may deem appropriate.
- (c) If in the opinion of an invigilator, circumstances arise which render an examination unfair to any candidate, he must report the matter to the Vice-Chancellor within 24

hours after the examination. Where such matter is reported to the Vice-Chancellor he may take such action as he deems fit. If he directs that another examination be held, that examination shall be the examination for the purpose of this regulation.

- (d) Any candidate or member of staff may complain to the Vice-Chancellor that an examination has been improperly conducted. The Vice-Chancellor shall investigate the complaint and report the result of his investigation to the Senate which shall take such action as it may deem appropriate, including withholding a result or deprivation of the award of a degree, diploma etc. as laid down in Statute 17. However, where it is shown to the satisfaction of the Committee of Deans that any alteration or amendment of University regulation involving a change in a course of study or in examination requirement has caused hardship to a candidate in any examination, the Committee of Deans shall make such provisions as it thinks fit for the relief of each hardship and report same to Senate.

## **STUDENT REGISTRATION ON E-PORTAL**

- Visit e-portal URL directly with [www.eportal.oauife.ng](http://www.eportal.oauife.ng)  
OR  
Visit OAU website ( [www.oauife.edu.ng](http://www.oauife.edu.ng)) and click “e-portal” from OAU Home Page
- From the e-portal home page: Click “Payment/Registration (on-line)
- From Login Screen
  - Read additional directives and comply
  - Click on “Submit” to display your identity for confirmation
  - Click “OK”
  - Click again “Payment/Registration (on-line)” to display list of tables of Students
- From the Table List
  - Click on “Bio-Data Form: to display “Submit Information Form (MIS2)” and fill accordingly
  - Click “Submit” to save your form.

# BACHELOR OF PHARMACY PROGRAMME

## Preamble

It is necessary that students should be provided with opportunity for the application of pharmaceutical and biomedical knowledge to problems of drug therapy related to patient care. The Faculty considers it desirable that students should become aware of the broader social content of health-care and use of medicine in order to encourage the concept of pharmaceutical care within the Health care delivery system.

We also have to comply fully to meet the need of a 4-year professional training in pharmacy, as much as it harmonises pharmacy education in the country and falls in line with the frame-work of the National Policy on Education. Since none of the Departments in the Faculty of Pharmacy gives separate degrees, a single structuring for all departments has been the goal so as to fully integrate all materials.

The principal objective of the Curriculum is to provide a plan for the education, development and training of qualified students for careers in pharmacy practice. The Curriculum would therefore provide the students with the following three areas of education:

- i. general education
- ii. basic and pre-clinical sciences
- iii. professional studies and training

The specific objectives of the B. Pharm. professional course are therefore as follows:

## A. *OBJECTIVES OF PHARMACY EDUCATION*

To equip the students with the knowledge, skill and attitude required for practice in the core pharmacy practice settings and respond to the local and global health challenges.

## B. *SPECIFICATION OF THE BASIC PHARMACEUTICAL SERVICES*

The Pharmaceutical services consist of:

- (a) Obtaining the drug materials
- (b) Preparing the drug in the form suitable for administration
- (c) Ensuring the quality of the final product
- (d) Distributing the drug to the consumer
- (e) Keeping watch to prevent misuse and minimize harmful effects of the drugs
- (f) Providing professional information on the drug products and,
- (g) Organizing, perpetuating and creating pharmaceutical knowledge

## HIGHLIGHTS OF THE B. PHARM. CURRICULUM

1. The period of training is five years (including the preliminary basic sciences year).
2. To be eligible for the award of the degree of Bachelor of Pharmacy (B. Pharm.), a candidate must satisfactorily complete a minimum of 164 units of courses (128 units for direct entry students). Each student must also pass 12 units of special elective courses offered in Faculties other than the Faculty of Pharmacy before graduation.
3. In order to provide instructions and exposure of students on the issue of clinical and social aspects of pharmaceutical services and care, the current programme has been structured to ensure better training involving patient contact and interaction both at the hospital and community levels.
4. The degree is unclassified with the pass mark of 50% as approved by the Pharmacists Council of Nigeria in all recognised institutions except in Dispensing (PHA 303) and Forensic Pharmacy and Pharmacy Ethics (PCA 401), where the pass mark is 60%.
5. Faculty, fully recognising that an integrated programme would best help the training of students, has pooled together certain topics which constitute courses placed in specific departments. The '08' numbered courses are of this category.
6. Courses run throughout the session or for one semester and are examined during the semester they terminate.
7. The regulations as regards the Final determination of the degree on weighting of each Part is 10%, 20%, 30% and 40% for Parts II, III, IV and V, respectively.
8. For the award of a distinction, i.e. a candidate receiving the Bachelor of Pharmacy degree with Distinction shall obtain a Grade Index of not less than 4.1.
9. All other University Examinations Regulations for Faculties not operating the course unit system will operate.

## GENERAL REGULATIONS FOR THE DEGREE OF BACHELOR OF PHARMACY

### Degree Awarded

1. Candidates for the first degree in the Faculty will proceed to the Degree of Bachelor of Pharmacy (B. Pharm.).
2. The Degree shall be awarded without honours. However, students with exceptional performances in the overall examination will be awarded a distinction.

### ADMISSION REQUIREMENTS

- (a) *UTME (JAMB)* - Candidates applying into the first year of the B. Pharm. Programme are required to have credit passes in five (5) subjects including English, Mathematics, Physics, Chemistry and Biology in the Senior Secondary School Certificate Examination or its equivalent.

- (b) *Direct Entry (JAMB)* - Candidates seeking direct admissions to Part II of the B. Pharm. degree programme must satisfy the matriculation requirements of the university and must in addition
- (i) have good Advanced Level GCE at Principal level or in equivalent examinations in Biology, Chemistry and Physics in not more than two sittings or must have qualifications or degrees which, as assessed by the Faculty Board of Pharmacy, are equivalent.
  - (ii) be graduates of this or other universities with programmes showing good performances in the biological and physical sciences in the transcript.
- (c) Other mode of Entry - Intra and Inter University transfer is also allowed. However, candidates transferring from other Universities are required to hold the minimum entry qualifications for admission into Obafemi Awolowo University. Transcripts of academic records and confidential reports of all such candidates (forwarded by their institutions) are required to be sent to, and received in the Admissions Office of the University not later than 30<sup>th</sup> August of the year of admission.

## **EXAMINATIONS REGULATIONS AND REQUIREMENTS FOR THE AWARD OF THE DEGREE**

(i) **Part I**

Students are expected to pass all Part I courses subject to Faculty of Science regulations before proceeding to Part II.

(ii) **Reference**

- (a) A candidate who fails in not more than three papers in Parts II – IV, may be allowed to resit the paper(s) once only provided his overall average is not less than 50%. Otherwise, he shall be required to repeat the year. A candidate who fails in not more than two papers in Part V may be allowed to resit the paper(s) once only provided his overall average is not less than 50%.
- (b) No candidate shall be awarded more than a B grade in a referred course for the purpose of the final classification.

(iii) **Repeat the year: Parts II, III and IV**

- (a) A candidate who fails in a referred subject or course shall be required to repeat the year as no further reference shall be allowed.
- (b) A candidate who fails in more than the allowable number of subjects or courses (as in Regulation 60 (ii) (a), and whose overall average is not less than 40% may be allowed to repeat the year; otherwise he shall be required to withdraw from the Faculty.

(iv) **Repeat the year: Parts V Examination**

A candidate who does not qualify for a degree may, with the consent of the Senate, be readmitted to the examination on one subsequent occasion only which shall be at the end of the following academic year. Such a student shall not be eligible for a distinction.

(vi) **Withdrawal from the Faculty**

A candidate who fails in either, the Part II, III or IV examinations at the second attempt shall be required to withdraw from the Faculty.

(vii) **Final Determination of Degree (Faculty of Pharmacy)**

The B. Pharm. degree shall be awarded without Honours. The individual letter grades of a candidate's scores in Parts II, III, IV and V examinations shall be assigned as follows:

A	=	5
B+	=	4
B	=	3
C	=	2
D	=	1
E or F	=	0

The total of the grade points scored by a candidate shall thus be divided by the number of courses taken and his Grade Index shall be used in determining distinction for the B. Pharm. degree.

For example, for a candidate who is required to sit for ten papers in any given session and who obtained 4A's, 3B+'s and 3B's, the Grade Index is calculated as follows:

$(4 \times 5) + (3 \times 4) + (3 \times 3)$  points = 41 points divided by 10 (i.e. the number of papers taken) = Grade Index of 4.1.

The results for Parts II, III, IV and V shall be weighted as 10%, 20%, 30% and 40% respectively.

(a) To qualify for the award of a Bachelor of Pharmacy degree a candidate must

(i) score not less than a grade of B (50%) in all Pharmacy courses registered for except for Dispensing (PHA 303) and Forensic Pharmacy and Pharmacy Ethics (PCA 401) where a pass mark of 60% is required. In the case of BCH 304 the regulations of the Faculty of Science shall prevail.

(ii) satisfactorily complete a minimum of 164 units of work (128 units for Direct entry students) and satisfy the subject

- requirements specified in the schedule of course and scheme of examination.
- (iii) attend and pass the prescribed examination in 12 units of special elective courses offered in Faculties other than the Faculty of Pharmacy.
- (b) For the award of distinction, a candidate shall be expected to obtain a Grade Index of not less than 4.1.

## COURSE CODES AND TITLES

BCH 303	Introductory Biochemistry I
BCH 304	Introductory Biochemistry II
CLI 307	Principles of Diseases and Pathology
CLI 511	Clinical Pharmacology
PCA 401	Forensic Pharmacy & Pharmacy Ethics
PCA 402	Pharmacy Management and Administration I
PCA 403	Pharmacy Management and Administration II
PCA 404	Biopharmaceutics and Pharmacokinetics
PCA 501	Clinical Pharmacokinetics
PCA 502	Drug Information Evaluation and Communication Skill
PCA 503	Clinical Pharmacy Clerkship
PCA 510	Project in Clinical Pharmacy and Pharmacy Administration
PCG 201	Introduction to Pharmacognosy and Organised Vegetable drugs.
PCG 202	Unorganised Drugs
PCG 308*	Separation Techniques in Pharmacy
PCG 301	Drugs of Biological Origin I
PCG 302	Drugs of Biological Origin II
PCG 401	Herbal Remedies in Traditional Medicine
PCG 402	Nigerian Medicinal Plants
PCG 501	Herbicides, Pesticides and Molluscicides
PCG 510	Project in Pharmacognosy
PCL 201	Anatomy and Physiology of Essential Organs I
PCL 202	Anatomy and Physiology of Essential Organs II
PCL 301	General Pharmacology I
PCL 302	General Pharmacology II
PCL 401	General Pharmacology III
PCL 408*	Chemotherapy
PCL 501	Toxicology
PCL 510	Project in Pharmacology
PHA 201	Introduction to Pharmaceutics
PHA 202	Introductory Pharmaceutical Microbiology
PHA 203	Practical Pharmaceutics
PHA 301	Liquid and Semi-solid Dosage Forms
PHA 302	Pharmaceutical Microbiology I
PHA 303	Dispensing
PHA 304	Pharmaceutical Microbiology II
PHA 401	Solid Dosage Forms
PHA 402	Pharmaceutical Microbiology III
PHA 501	Pharmaceutical Industrial Development and Processing



PHA 502	Pharmaceutical Microbiology IV
PHA 503	Developments in Dosage Forms Design
PHA 510	Project in Pharmaceutics
PHC 201	Pharmaceutical Inorganic and Physical Chemistry
PHC 202	Pharmaceutical Organic Chemistry
PHC 203	Practical Pharmaceutical Chemistry I
PHC 301	Radiopharmacy and selected physicochemical Methods of Analysis.
PHC 401	Medicinal Chemistry I
PHC 402	Medicinal Chemistry II
PHC 501	Principles of Drug Development and Design
PHC 508*	Pharmaceutical Analysis and Drug Quality Control
PHC 510	Project in Pharmaceutical Chemistry

### KEY TO COURSE CODES

BCH	Biochemistry Courses offered in the Faculty of Science
CLI	Courses specially designed for pharmacy students and offered by Faculty of Clinical Sciences.
PCA	Courses in Clinical Pharmacy and Pharmacy Administration
PCG	Courses offered in the Department of Pharmacognosy
PCL	Courses offered in the Department of Pharmacology
PHA	Courses offered in the Department of Pharmaceutics
PHC	Courses offered in the Department of Pharmaceutical Chemistry.

\*All code numbers ending in 08 are for courses into which other pharmacy departments have some input but are co-ordinated in the designated department. Programme for the teaching of such courses are to be presented to Board of Studies at the beginning of each academic session.

### PRE-REQUISITE

The Courses in the Pharmacy Programme are integrated Courses, hence, the input from each of the Departments have been carefully structured. Consequently, pre-requisite for Courses in Parts III to V will be all those Courses which are in the preceding year except that, in Part III, BCH 303, is a pre-requisite for BCH 304. Also, the pre-requisite for Part II Courses are clearly all the Part I Courses since no carry-over to Part II is allowed.

## FACULTY OF PHARMACY - SCHEDULE OF COURSES AND SCHEME OF EXAMINATIONS

The courses and examinations are divided into five years namely- Part I, Part II, Part III, Part IV and Part V each extending over one academic year (i.e. two semesters). The subjects and scheme of examinations are:

### PART I

Course Code	Course Title	Harmattan Hours/Week	Units	Rain Hours/Week	Units	Department	Examinations
MTH 105	Maths for Biological Sciences I	4 + 0 + 0	4	0 + 0 + 0	-	Mathematics	1 paper in Harmattan
MTH 106	Maths for Biological Sciences II	0 + 0 + 0	-	4 + 0 + 0	4	Mathematics	1 paper in Rain
PHY 105	Physics for Biological Sciences I	3 + 1 + 0	4	0 + 0 + 0	-	Physics	1 paper in Harmattan
PHY 106	Physics for Biological Sciences II	0 + 0 + 0	-	3 + 1 + 0	4	Physics	1 paper in Rain
PHY 107	Experimental Physics IA	0 + 0 + 3	1	0 + 0 + 0	-	Physics	Practical assessment
PHY 108	Experimental Physics IB	0 + 0 + 0	-	0 + 0 + 3	1	Physics	Practical assessment
CHM 101	Introductory Chemistry I	3 + 1 + 3	5	0 + 0 + 0	-	Chemistry	1 paper in Harmattan
CHM 102	Introductory Chemistry II	0 + 0 + 0	-	3 + 1 + 3	5	Chemistry	1 paper in Rain
BOT 101	Introductory Botany I	2 + 0 + 3	3	0 + 0 + 0	-	Botany	1 paper in Harmattan
BOT 103	Experimental Botany I	0 + 0 + 3	1	0 + 0 + 0	-	Botany	Practical assessment
ZOO 101	Introductory Zoology I	3 + 0 + 0	3	0 + 0 + 0	-	Zoology	1 paper in Harmattan
ZOO 103	Experimental Zoology I	0 + 0 + 3	1	0 + 0 + 0	-	Zoology	Practical assessment
	Special Electives	2 + 0 + 0	2	0 + 0 + 0	-		1 paper in Harmattan
	Special Electives	0 + 0 + 0	-	2 + 0 + 0	2		1 paper in Rain
<b>Total</b>			<b>24</b>		<b>16</b>		

## PART II

Course Code	Course Title	Harmattan Hours/Week	Units	Rain Hours/Week	Units	Department	Examinations
PHA 201	Introductory Pharmaceutics I	2 + 0 + 0	2	1 + 0 + 0	1	Pharmaceutics	1 paper in Rain
PHA 202	Introductory Pharmaceutical Microbiology	1 + 0 + 3/2	1½	1 + 0 + 3/2	1½	Pharmaceutics	1 paper in Rain
PHA 203	Practical Pharmaceutics I	0 + 0 + 3	1	0 + 0 + 3	1	Pharmaceutics	1 paper in Rain
PCG 201	Introduction to Pharmacognosy and Organised Vegetable Drugs	2 + 0 + 3	3	0 + 0 + 0	-	Pharmacognosy	1 paper in Harmattan
PCG 202	Unorganised Drugs	0 + 0 + 0	-	1 + 0 + 3	2	Pharmacognosy	1 paper in Rain
PCL 201	Anatomy and Physiology of Essential Organs I	3 + 0 + 6	5	0 + 0 + 0	-	Pharmacology	1 paper in Harmattan
PCL 202	Anatomy and Physiology of Essential Organs II	0 + 0 + 0	-	2 + 0 + 4	3	Pharmacology	1 paper in Rain
PHC 201	Pharmaceutical Inorganic and Physical Chemistry	2 + 0 + 0	2	2 + 1 + 0	3	Pharm. Chem.	1 paper in Rain
PHC 202	Pharmaceutical Organic Chemistry	2 + 0 + 0	2	2 + 1 + 0	3	Pharm. Chem.	1 paper in Rain
PHC 203	Practical Pharmaceutical Chemistry I	0 + 0 + 3	1	0 + 0 + 3	1	Pharm. Chem.	Practical assessment
	Special Electives	2 + 0 + 0	2	0 + 0 + 0	-		1 paper in Harmattan
	Special Electives	0 + 0 + 0	-	2 + 0 + 0	2		1 paper in Rain
<b>Total</b>			<b>19½</b>		<b>17½</b>		

### PART III

Course Code	Course Title	Harmattan Hours/Week	Units	Rain Hours/Week	Units	Department	Examinations
PHA 301	Liquid and Semi-Solid Dosage forms	2 + 0 + 0	2	2 + 0 + 0	2	Pharmaceutics	1 paper in Rain
PHA 302	Pharmaceutical Microbiology I	2 + 0 + $\frac{3}{2}$	2½	0 + 0 + 0	-	Pharmaceutics	1 paper in Harmattan
PHA 303	Dispensing	0 + 0 + 3	1	0 + 0 + 3	1	Pharmaceutics	1 paper in Rain
PHA 304	Pharmaceutical Microbiology II	0 + 0 + 0	-	1 + 0 + $\frac{3}{2}$	1½	Pharmaceutics	1 paper in Rain
PCG 308	Separation Techniques in Pharmacy	1 + 0 + 0	1	0 + 0 + 0	-	Pharmacognosy	1 paper in Harmattan
PCG 301	Drugs of Biological Origin I	2 + 0 + 4	3	0 + 0 + 0	-	Pharmacognosy	1 paper in Harmattan
PCG 302	Drugs of Biological Origin II	0 + 0 + 0	-	2 + 0 + 3	3	Pharmacognosy	1 paper in Rain
PCL 301	General Pharmacology I	2 + 0 + 3	3	0 + 0 + 0	-	Pharmacology	1 paper in Harmattan
PCL 302	General Pharmacology II	0 + 0 + 0	-	2 + 0 + 3	3	Pharmacology	1 paper in Rain
PHC 301	Radiopharmacy and selected physico-chemical Methods of Analysis	1 + 0 + 0	1	1 + 1 + 4	3	Pharm. Chem.	1 paper in Rain
BCH 303	Introductory Biochemistry I	3 + 0 + 0	3	0 + 0 + 0	-	Biochemistry	1 paper in Harmattan
BCH 304	Introductory Biochemistry II	0 + 0 + 0	-	3 + 0 + 4	3	Biochemistry	1 paper in Harmattan
CLI 307	Principles of Diseases and Pathology	0 + 0 + 0	-	2 + 0 + 0	2	Chemical Pathology	1 paper in Rain
	Special Electives	2 + 0 + 0	2	0 + 0 + 0	-		1 paper in Harmattan
	Special Electives	0 + 0 + 0	-	2 + 0 + 0	2		1 paper in Rain.
<b>Total</b>			<b>18½</b>		<b>20½</b>		

## PART IV

Course Code	Course Title	Harmattan Hours/Week	Units	Rain Hours/Week	Units	Department	Examinations
PHA 401	Solid Dosage Forms	1 + 0 + 3	2	1 + 0 + $\frac{3}{2}$	1½	Pharmaceutics	1 paper in Rain
PHA 402	Pharmaceutical Microbiology III	1 + 0 + $\frac{3}{2}$	1½	1 + 0 + $\frac{3}{2}$	1½	Pharmaceutics	1 paper in Rain
PCG 401	Herbal Remedies in Traditional Medicine	1 + 0 + 0	1	0 + 0 + 0	-	Pharmacognosy	1 paper in Harmattan
PCG 402	Nigerian Medicinal Plants	0 + 0 + 0	-	1 + 1 + 0	2	Pharmacognosy	1 paper in Rain
PCL 401	General Pharmacology III	2 + 0 + 4	3	0 + 0 + 0	-	Pharmacology	1 paper in Harmattan
PCL 408	Chemotherapy	1 + 0 + 0	1	2 + 0 + 0	2	Pharmacology	1 paper in Rain
PHC 401	Medicinal Chemistry I	2 + 0 + 4	3	0 + 0 + 0	-	Pharm. Chem.	1 paper in Harmattan
PHC 402	Medicinal Chemistry II	0 + 0 + 0	-	2 + 0 + 4	3	Pharm. Chem.	1 paper in Rain
PCA 401	Forensic Pharmacy & Pharmacy Ethics	1 + 0 + 0	1	1 + 0 + 0	1	CPPA	1 paper in Rain
PCA 402	Pharmacy Management & Administration I	2 + 0 + 0	2	0 + 0 + 0	-	CPPA	1 paper in Harmattan
PCA 403	Pharmacy Management & Administration II	0 + 0 + 0	-	2 + 0 + 0	2	CPPA	1 paper in Rain
PCA 404	Biopharmaceutics and Pharmacokinetics	1 + 0 + 0	1	1 + 1 + 0	2	CPPA	1 paper in Rain.
	Special Electives	2 + 0 + 0	2	0 + 0 + 0	0		1 paper in Harmattan
	Special Electives	0 + 0 + 0	0	2 + 0 + 0	2		1 paper in Rain
<b>Total</b>			<b>17½</b>		<b>17</b>		

## PART V

Course Code	Course Title	Harmattan Hours/Week	Units	Rain Hours/Week	Units	Department	Examinations
PHA 501	Pharmaceutical Industrial Development & Processing	2 + 0 + 4/2	2½	0 + 0 + 0	-	Pharmaceutics	1 paper in Harmattan
PHA 502	Pharmaceutical Microbiology IV	0 + 0 + 0	-	2 + 0 + 0	2	Pharmaceutics	1 paper in Rain
PHA 503	Developments in Dosage Form Design.	0 + 0 + 0	-	1 + 0 + 0	1	Pharmaceutics	1 paper in Rain.
PCG 501	Herbicides, Pesticides and Molluscicides	1 + 0 + 0	1	0 + 0 + 0	-	Pharmacognosy	1 paper in Harmattan
PCL 501	Toxicology	1 + 0 + 0	1	2 + 0 + 0	2	Pharmacology	1 paper in Rain
PHC 501	Principles of Drug Development and Design	1 + 0 + 0	1	0 + 0 + 0	-	Pharm. Chem.	1 paper in Harmattan
PHC 508	Pharmaceutical Analysis and Drug Quality Control	1 + 0 + 6	3	1 + 0 + 0	1	Pharm. Chem.	1 paper in Rain
PCA 501	Clinical Pharmacokinetics	1 + 0 + 0	1	0 + 0 + 0	-	CPPA	1 paper in Harmattan
PCA 502	Drug Information Evaluation and Communication Skill	2 + 0 + 0	2	0 + 0 + 0	-	CPPA	1 paper in Harmattan
PCA 503	Clinical Pharmacy Clerkship	1 + 0 + 4	2	1 + 0 + 12	4	CPPA	1 paper in Rain
CLI 511	Clinical Pharmacology	2 + 0 + 0	2	0 + 0 + 0	-	Medicine/CPA	1 paper in Harmattan
PHA, PCG, PCL, PHC, PCA 510	Final Year Project in the various Departments	0 + 0 + 6	2	0 + 0 + 6	2	All Departments	
	Special Electives	2 + 0 + 0	2	0 + 0 + 0	0		1 paper in Harmattan
	Special Electives	0 + 0 + 0	0	2 + 0 + 0	2		1 paper in Rain
<b>Total</b>			<b>19½</b>		<b>14</b>		

## SYLLABUS

<i>COURSE CODE:</i>	BCH 303 & BCH 304
<i>COURSE TITLE</i>	Introductory Biochemistry I & II
<i>UNITS:</i>	3 + 0 + 0; 3 + 0 + 4 = 6 units

### **Course Content:**

A short review of the chemistry of the major constituents of cells: carbohydrates, lipids, proteins, nucleic acids and nucleoproteins. pH and buffers. Enzymes and coenzymes, Metabolism: methods used in the study of metabolism, bioenergetics, metabolism of carbohydrate, lipids and amino acids. Electron transport and oxidative phosphorylation. Metabolism of purines, pyrimidines and nucleotides. Biosynthesis of nucleic acids and proteins. Regulation of metabolism. Hormones.

<i>COURSE CODE:</i>	CLI 307
<i>COURSE TITLE:</i>	Principles of Diseases and Pathology
<i>UNITS</i>	0 + 0 + 0; 2 + 0 + 0 = 2 units

### **COURSE DESCRIPTION:**

The course is designed to recognise the phenomena of disease as problems of disturbed physiology and to introduce Pharmacy students to the nature, types and causes of various disease particularly those they are likely to come across during their professional career.

### **Terminal Objectives:**

At the end of the course the student should be able to:

- (i) understand the mechanism of cellular injury and death;
- (ii) understand the pathophysiological basis/pathogenesis of disease states.

### **Course Content:**

- (1) The normal cell and the adapted cell.
- (2) Cell injury and cell death
- (3) Body's reaction to disease - inflammation and immunity
- (4) Neoplasia and its clinical aspects.
- (5) Genetic factors in disease.
- (6) Immunological factors in disease
- (7) Fungal and viral infections
- (8) Parasitic infestations
- (9) Deficiency diseases
  - (a) Protein-calorie malnutrition
  - (b) Vitamins and minerals deficiency
- (10) Sexually transmitted diseases

- (11) Endocrine and metabolic diseases
- (12) Neurological and emotional diseases
- (13) Infectious diseases
- (14) Adverse reactions to drugs

**DEPARTMENT OF CLINICAL PHARMACY AND PHARMACY  
ADMINISTRATION**

*COURSE CODE:* PCA 401  
*COURSE TITLE:* Forensic Pharmacy & Pharmacy Ethics  
*UNITS:* 1 + 0 + 0; 1 + 0 + 0 = 2 units

**Objectives:**

At the end of the course, the students are expected to know:

- (a) Pharmacy Laws.
- (b) Drug rules and regulations.
- (c) Pharmacy and drug-related decrees and Acts promulgated by the Federal Government of Nigeria.

**Course Content:**

1. History of Pharmacy in Nigeria
2. Pharmaceutical Organisations
3. National Drug Policy
4. National Drug Formulary & Essentials Drugs List.
5. Pharmacy Ethics.
6. Pharmacists Council Decree
7. Poisons and Pharmacy Act.
8. Counterfeit and Fake Drugs (Miscellaneous Provisions Act).
9. Patent and Proprietary Medicine Vendors Licence.
10. Drug Advertisement.
11. NDLEA Decree
12. Indian Hemp Decree.
13. The Dangerous Drug Act
14. NAFDAC Decree
15. The Food, Drugs and Cosmetics Act.
16. Drugs and related products Registration Decree.



*COURSE CODE:* PCA 402  
*COURSE TITLE:* Pharmacy Management and Administration I  
*UNITS:* 2 + 0 + 0; 0 + 0 + 0 = 2 units

**Objectives:**

At the end of the course, the students are expected to:

- (i) Explain the role of the pharmacist in the management and administration of pharmacies.
- (ii) Show knowledge of the organisational structure of pharmaceutical concerns.
- (iii) Have sufficient knowledge of principles of organisation.
- (iv) Draw up adequate plans for the sustained growth of any concern, given relevant data.
- (v) Explain the significance of financial and human resources management in pharmaceutical business. Be able to recruit, train, supervise and motivate the various levels of personnel involved in any pharmaceutical operation.

**Course Content:**

- (a) The role of the pharmacist in the management and as drug controller within the hospital and retail establishments.
- (b) Principles of organisation - the classical motivational theory, patterns of management analysis, the classical and humanistic organisational theory, decision making theory, role of financial management in the business, organisational control and leadership;
- (c) Pharmacy lay-out in its relation to volume and service to be provided; product selection, store and stock keeping and filing system mechanics.
- (d) Staffing and selection of personnel, inter-professional interactions and co-operation.

*COURSE CODE:* PCA 403  
*COURSE TITLE:* Pharmacy Management and Administration II  
*UNITS:* 0 + 0 + 0; 2 + 0 + 0 = 2 units

**Objectives:**

At the end of the course, each student should be able to:

- (i) Explain the role and functions of a pharmacist in the community Pharmacy.
- (ii) Show awareness of the legal aspects of setting up a pharmaceutical business.
- (iii) Show understanding of location analysis and evaluation of various types of pharmacies.
- (iv) List the various sources of capital for setting up a pharmaceutical business.
- (v) Discuss the design and modernization of pharmacies

**Course Content:**

- (1) Factors relating to starting a community pharmacy, pharmacy as a retail institution, location analysis and evaluation, stock and fixtures, turn-over, goodwill.
- (2) Functions and process of marketing, layout, design and modernization of pharmacies, financial arrangement.
- (3) Purchasing systems, turn-over and inventory control, pricing and fee concepts, control of costs cash and credits, financial analysis and evaluation.
- (4) Arrangement of fixtures, stocks lighting, displays, dispensary area, product selection.
- (5) Community medical information service.

**COURSE CODE:** PCA 404

**COURSE TITLE:** Biopharmaceutics and Pharmacokinetics

**UNITS:** 1 + 0 + 0; 1 + 1 + 0 = 3 units

**Objectives:**

- (i) The student should gain an understanding of:
  - (a) the factors affecting absorption, distribution, metabolism and excretion of drugs
  - (b) the different pathways of drug metabolism
  - (c) the methods of studying drug metabolism
- (ii) The student should be able to:
  - (a) define the basic concepts of pharmacokinetics
  - (b) use raw data to derive the pharmacokinetics parameters and models that best describe the process of drug absorption, distribution and elimination
  - (c) critically evaluate biopharmaceutical studies - involving drug product bioequivalency.
  - (d) design and evaluate dosage regimens of drugs using pharmacokinetic and biopharmaceutic parameters.

**Course Content:**

1. Fate of drug after administration including physico-chemical factors affecting drug disposition, routes of drug administration and influence of route of administration on drug bioavailability.
2. Drug Metabolism - Metabolic pathways from chemical structure, metabolic pathways of named examples of drugs, methods of studying drug metabolism.
3. Pharmacokinetics
  - (a) Definition of terminology and symbols

- (b) Pharmacokinetics of drug absorption, distribution and elimination (excretion and metabolism) after various routes of administration.
- (c) Compartment models - single and multiple compartments as related to drug distribution.
- (d) Pharmacokinetics of multiple dosage regimens and after administration of prolonged or sustained action dosage forms;
- (e) Design of dosage regimens based on pharmacokinetics principles;
- (f) Non-linear pharmacokinetics;
- (g) Relationship between pharmacokinetics parameters and pharmacological response;
- (h) Pharmacogenetics
- (i) Biostatistics

*COURSE CODE:* CLI 511  
*COURSE TITLE:* Clinical Pharmacology  
*UNITS:* 2 + 0 + 0; 0 + 0 + 0 = 2 units

**Course Description:**

- (i) The underlying principle therein is that the pathophysiology of disease and basic facts of pharmacology must be interdigitated in order to select drugs and establish therapeutic objectives.
- (ii) To foster an attitude of advising the physician based on basic knowledge of therapeutics.

**Course Content:**

1. Introduction to clinical pharmacology
2. Clinical Pharmacokinetics and therapeutic drug monitoring.
3. Mechanism of adverse drug reactions.
4. Adverse drug interactions
5. Bronchodilators and Respiratory drugs
6. Drugs and cardiovascular diseases.
7. Drug use in gastrointestinal diseases
8. Anticonvulsants and drugs in neurological disorders
9. Psychotropic and anxiolytic drugs.
10. Drug use in pregnancy and lactation and extremes of age
11. Principle of antimicrobial and antiparasitic chemotherapy
12. Phases I - IV clinical pharmacological trials and development of new drugs.
13. Insulin and oral hypoglycaemics and antithyroid drugs.
14. Antineoplastic drugs and drug use in haematology
15. Qualitative aspect of therapeutics decision making.

**COURSE CODE:** PCA 501  
**COURSE TITLE:** Clinical Pharmacokinetics  
**UNITS:** 1 + 0 + 0; 0 + 0 + 0= 1 unit

**Objectives:**

At the end of the study the student should be able to:

- (i) design, evaluate and individualise dosage regimens in clinical situations, using pharmacokinetic and biopharmaceutic parameters.
- (ii) detect potential clinical problems and apply basic pharmacokinetic principles to solve them.

**Course Content:**

- (1) Pharmacokinetics of drugs under disease states that modify body functions e.g. renal and liver diseases, diseases that modify protein binding etc.
- (2) Pharmacokinetics of drugs in the paediatric and elderly populations as well as in pregnant and lactating mothers.
- (3) Prescribing under the above conditions
- (4) Consideration of the clinical pharmacokinetics of selected drugs used in various disease states.

**COURSE CODE:** PCA 502  
**COURSE TITLE:** Drug Information Evaluation and communication Skills  
**UNITS:** 2 + 0 + 0; 0 + 0 + 0= 2 units

**Course Description:**

This course introduces the student to the use of drug literature in the promotion of safe, effective and rational drug therapy. It helps the student to develop the skills for communicating effectively with other health care professionals and the patient. The course is also aimed at preparing the student for rendering health services to the rural populace. It assumes the student's knowledge of pharmaceutics, biopharmaceutics, pharmacokinetics and pharmacotherapeutics.

**Terminal Objectives:**

At the end of the course, the student should be able to:

- (i) rapidly retrieve, evaluate and effectively disseminate information on drug therapy;
- (ii) communicate effectively with other health care professionals and patients;
- (iii) develop and maintain a patient medication profile for drug monitoring;
- (iv) counsel a patient on how to use his/her drugs

- (v) offer health maintenance care (preventive medicine) involving the education of patients on the prevention of communicable disease, surveillance on patient's immunisation status - rural pharmacy service as extension work;
- (vi) offer acute primary care to patients who have episodic self limiting `diseases;
- (vii) offer chronic primary care to patients who have chronic diseases or are utilizing chronic medication therapy after diagnosis and stabilisation by a physician;
- (viii) educate the patient on oral rehydration therapy and personal hygiene; and
- (ix) educate the patient on use of traditional therapeutic agents and herbal phytotherapy in patient management.

**Course Content:**

1. Drug Information retrieval and literature evaluation:
  - (a) A study of the methods and resources available for the rapid and efficient handling of actual drug information and its effective utilization in the promotion of safe, effective and rational drug therapy.
  - (b) Resources needed for the establishment of a drug information centre and the provision of drug information service.
  - (c) Development of the hospital formulary system and essential drugs list and publication of drug information bulletin.
2. Communication Skills:
  - (a) Appearance as a mode of communication
  - (b) The various styles of listening and response to patient interview and education (pharmacist-patient relationship).
  - (c) Factors affecting patient compliance with drug regimen
  - (d) Pharmacists' relationship with other health care professionals.

**COURSE CODE:** PCA. 503  
**COURSE TITLE:** Clinical Pharmacy Clerkship  
**UNITS:** 1 + 0 + 4; 1 + 0 + 12 = 6 units

**Course Descriptions:**

The clinical pharmacy clerkship consists of the pharmacy-based experience (externship) and the clinical clerkship (medical experiences). The pharmacy-based practice involves scrutinizing prescriptions for completeness, dispensing and patient counselling under the supervision of a pharmacist. The clinical clerkship involves the posting of students to the hospital wards to form an integral part of the medical team. Emphasis is placed on therapeutic monitoring of patients, rational drug selection and dosing, monitoring for drug interactions and adverse drug reactions, taking of medication histories, patient counselling and education.

### **Terminal objectives:**

At the end of the clerkship, the student should be able to:

- i. scrutinize a prescription for completeness - eliminating therapeutic duplication, drug interactions, adverse drug reactions and contra-indicated therapy, dispense drugs and counsel patients on their use(s);
- ii. take medication histories which would help in the monitoring of patient compliance;
- iii. keep medication profiles and monitor for drug interactions and adverse reactions;
- iv. monitor patients' drug therapy through the use of plasma drug levels and body fluid chemistry and be able to develop an individualized dosage regimen.
- v. counsel and educate the patient as well as other health care professionals on the use of drugs through the provision of drug information.

### **Course Content:**

Pharmacy Supervised experiences (Externship):

- (a) Dispensing to in-and-out-patients - Scrutinising of prescriptions and dispensing:
  - (i) medication dosage and instructions on mode of administration;
  - (ii) compatibility of drug combinations, and
  - (iii) alternatives to prescribed drugs
- (b) Patients Counselling/Education:
  - (i) patient drug history and medication profiles;
  - (ii) patient medication instruction cards; and
  - (iii) patient compliance.
- (c) Pharmacists' Clinical Role:
  - (i) dispensing (in and-out-patients)
  - (ii) organisation of patients' medical chart and medication profiles.
  - (iii) medication dosages, posology and administration
  - (iv) monitoring of drug interactions and adverse drug reactions
  - (v) patient counselling
- (d) Signs and symptoms of drug toxicity and ways of treatment.
- (e) Postings to Community Pharmacies and the University Health Centre Pharmacy.

## DEPARTMENT OF PHARMACOGNOSY

<i>COURSE CODE:</i>	PCG 201
<i>COURSE TITLE:</i>	Introduction to Pharmacognosy and Organised Vegetable Drugs
<i>UNITS:</i>	2 + 0 + 3; 0 + 0 + 0 = 3 units

### **Objectives:**

To link the previous knowledge of the student in biological sciences with pharmacognosy. To familiarise the student with organised drugs available in the world commerce, their morphological, microscopical and chemical characters.

### **Course Content:**

The scope of Pharmacognosy. Classification of Drugs with a brief mention of plant nomenclature, taxonomy; plant description morphology and anatomy. The living plant cell; cell differentiation and cell contents.

The following plant drugs will be studied: Digitalis, Senna, Tobacco, Ocimum, *Azadirachta indica*, *Ficus vogellii*, *Thevetia* spp. *Catharanthus roseus*; *Cascara*, Cinnamon, Cassia bark, Cinchona, Rauwolfia, Ginger, *Zanthoxylum*, Clove, Pyrethrum, Fennel, Cardamon, Capsicum, Tamarind, Vanilla, *Strophantus*, Cocoa, Calabar beans, Castor oil beans, Cola, Grains of Paradise, *Cannabis sativa*.

Laboratory classes in which the organised drugs are examined macroscopically, microscopically and chemically will complement the lectures.

<i>COURSE CODE:</i>	PCG 202
<i>COURSE TITLE:</i>	Unorganised Drugs
<i>UNITS:</i>	0 + 0 + 0; 1 + 0 + 3 = 2 units

### **Objectives:**

To familiarise the student with unorganised drugs available to the Pharmaceutical profession commercially, their morphological, microscopical and chemical characters.

### **Course Content:**

This course will deal with the unorganised drugs, fibres and surgical dressings. The drugs include Acacia, Tragacanth, Agar, *Sterculia Spermoceti*, Beeswax, Wool fat, Opium, Aloes, Balsam of Tolu, Balsam of Peru, Styrax, Gelatin, Cotton, Wool, Jute, Hemp, Flax, Silk, Rayon, Bandages and dressings, Cellulose wadding, Rayon dressing; adulteration, substitution and evaluation of surgical dressing.

Laboratory classes in which the unorganised drugs are examined macroscopically, microscopically and chemically will complement the lectures.

**COURSE CODE:** PCG 301  
**COURSE TITLE:** Drugs of Biological Origin I  
**UNITS:** 2 + 0 + 4; 0 + 0 + 0 = 3 units

**Objective:**

At the end of the course, the student would have acquired some knowledge about the source, chemical nature and uses of some important drugs of biological origin.

**Course Content:**

**CARBOHYDRATES AND RELATED COMPOUNDS** - Concepts, classification, biosynthetic origin, and properties. Mannoses and related compounds including fermentation products. Glycosides: - nature, biosynthetic origin and classification, (Holosides, oligosides, sugars, polyosides – gums, mucilages, etc). Heterosides (O-, S-, N, C- glycosides), amino sugars derived antibiotics.

**AMINO ACIDS and PEPTIDES** - Classification, biosynthetic origin, properties, applications in Pharmacy.

**PURINES, PYRIMIDINES AND RELATED COMPOUNDS** (Methylated purines)

**VITAMINS** - Water and fat soluble, their properties and uses

**ALKALOIDS** - Structures, classification, occurrence, biosynthetic origin, general chemical properties, production and evaluation. Alkaloids derived from ornithine, lysine, nicotinic acid, phenylalanine tyrosine, tryptophan and histidine.

Laboratory classes in which the various natural products of pharmaceutical interests are put to test to determine their chemical nature and purity will complement the lectures.

**COURSE CODE:** PCG 302  
**COURSE TITLE** Drugs of Biological Origin II  
**UNITS:** 0 + 0 + 0; 2 + 0 + 4 = 3 units

**Objectives:** As in PCG 301

**Course Content:**

**ACETATE AND PROPIONATE DERIVED DRUGS** - Tetracyclines, Nystatin, Erythromycin - biosynthetic origin, occurrence, classification, properties. Fats, and Waxes - Drugs derived from fats, biosynthetic origin, properties and uses in Pharmacy.

**POLYKETIDES** - Biosynthetic origin, occurrence properties, classification. Anthraquinones, flavonoids and related compounds e.g. griseofulvin.

**ISOPRENOIDS** - Concepts, roles, classification, distribution, biosynthetic origin, significance. Sterols, steroids, hormones, cardenolides, steroidal saponins and alkaloids.

**TERPENOIDS** - Essential oils (accumulation, taxonomic significance, biosynthetic origin, occurrence, preparation, properties, terpenoid oils, uses, testing). Resins, Oleoresins and Balsams. Non-volatile terpenoids (cannabinoids, abietic acid).



SHIKIMIDES - Coumarins and derivatives, Lignans, Benzenoids and Gallotannins. Practical classes in which the various natural products of pharmaceutical interest are put to test to determine their chemical nature and purity will complement the lectures.

**COURSE CODE:** PCG 308  
**COURSE TITLE:** Separation Techniques in Pharmacy  
**UNITS:** 1 + 0 + 0; 0 + 0 + 0 = 1 unit

**Objective:**

To expose the student to all separation techniques employed in the analysis of drug and drug products.

**Course Content:**

Extraction processes used in the preparation of galenicals in Pharmacy; maceration and percolation processes. Hot and cold extractions, continuous hot extraction, principle of partition coefficient between two immiscible liquids. Introduction to the principles and application of the following separation techniques in Pharmacy - the different types of chromatography, paper chromatography (PC), thin layer chromatography (TLC), high pressure liquid chromatography (HPLC) and gas chromatography (GC). Electrophoresis, column chromatography, counter current chromatography, ion exchange, gel filtration.

**COURSE CODE:** PCG 401  
**COURSE TITLE:** Herbal Remedies in Traditional Medicine  
**UNITS:** 1 + 0 + 0; 0 + 0 + 0 = 1 unit

**Objectives:**

At the end of the course, the student should be able to understand the basic principles of the traditional healing methods as well as have a working knowledge of the most commonly used herbal drugs in Nigeria. The beneficial and adverse features of traditional form of Health Care will be obvious to the student such that he is better able to work in a community where both traditional and modern forms of treatment (or more of the traditional) are in use. The course will also equip him to be able to assess traditional cures objectively.

**Course Content:**

Traditional Medicine: definitions and terminology; Historical review methods and techniques. Standardization of herbal portions. Scientific evidence ascertaining some remedies or practices used in traditional medicine. Relationships between plants used in traditional medicine and modern drugs. Advantages and disadvantages of traditional medicine. Integration or co-recognition of traditional and modern medicine. Field trips to traditional medical clinics.

*CODE:* PCG 402  
*TITLE:* Nigerian Medicinal Plants  
*UNITS:* 0 + 0 + 0; 1 + 1 + 0 = 2 units.

**Objectives:**

To study Nigerian medicinal plants which have been investigated chemically and biologically. At the end of the course the student will have knowledge of how to screen for bioactive agents from plant and the state of medicinal plant research in Nigeria.

**Course Content:**

Methods of obtaining information on medicinal plants. Screening plants for bioactive agents. Guidelines for research on medicinal plants for local drug production. Research trends on medicinal plants. Some common medicinal plants. Field trips within and outside the University campus to see some of the Nigerian Medicinal Plants.

*COURSE CODE:* PCG 501  
*COURSE TITLE:* Herbicides, Pesticides and Molluscicides  
*UNITS:* 1 + 0 + 0; 0 + 0 + 0 = 1 unit

**Objectives:**

At the end of the course, the student should have a working knowledge of available pesticides (which as a pharmacist, he may have to use); their chemical nature and mode of action. He would also be able to advice on the use of the appropriate pesticides used in cultivation and storage of plant drugs and their hazards to man.

**Course Content:**

Rodents, insects, snails as intermediates in disease dissemination. Public stakes in their control. Pest reduction, exclusion, eradication. Classification, chemistry, toxicology and uses of synthetic and natural pesticides. Plants with insecticidal and molluscicidal properties. Hazards and precautions in their use. Laws extending to pest-control products.

**DEPARTMENT OF PHARMACOLOGY**

*COURSE CODE:* PCL 201  
*COURSE TITLE:* Anatomy and Physiology of Essential Organs I  
*UNITS:* 3 + 0 + 6; 0 + 0 + 0 = 5 units

**Objectives:**

- (i) To provide knowledge of the composition and function of blood and body fluids.
- (ii) To teach relevant anatomy, physiology and function of essential body organs.
- (iii) To provide knowledge of some histology and histochemical techniques

**Course Content:**

*Historical perspective* - Blood and Body Fluids, Composition of blood and lymph. Chemistry of Blood plasma. Plasma and serum proteins. Red blood cell functions, White blood cell functions. Defence mechanisms, antibody-antigen interactions. Mechanism of blood coagulation. Blood disorders (anaemias and leukemias) and treatment.

*Cardiovascular System* - Anatomy and physiology of the heart. The electrocardiogram. Principles of blood circulation (systemic, pulmonary and coronary). Cardiac output, arterial venous and capillary pressures. Control of blood pressure. Auto-nervous and normal regulations. Cardiac failure and hypertension.

*Renal System* - Physiology, anatomy and functions of the kidney. Formation of urine. Micturition. Regulation of extracellular fluids - diuretics. Regulation of Acid-base balance: Therapeutic alterations of urinary pH. Renal disease and treatment. Control of body pH. Some selected practicals on the above and histology.

*Respiratory System* - Physiology of the respiratory system. Pulmonary ventilation. Mechanism of breathing. Volumes, pressure and composition of respiratory gases. Mechanism of, and factors affecting gaseous exchange. Diffusion of oxygen and carbon dioxide through the respiratory membrane. Transport of oxygen and carbon dioxide in the blood and body fluids. Nervous and chemical control of respiration. Respiratory insufficiency. Extraneous influences affecting respiration. Drugs affecting respiration and respiratory disorders.

*Alimentary System* - Physiology of the alimentary tract. Movement of food through the alimentary canal. Secretory functions of the alimentary tract. Digestive juices. The liver and biliary system. Absorption and storage of metabolites. Carbohydrates, protein and fat metabolism. Water absorption in the large intestine. Defecation and cathartics. Diseases of the alimentary system (ulcer, diarrhoea, constipation and drug treatment).

**COURSE CODE:** PCL 202

**COURSE TITLE:** Anatomy and Physiology of Essential Organs II

**UNITS:** 0 + 0 + 0; 2 + 0 + 4 = 3 units

**Objectives:**

To acquaint the student with the anatomical and functional organization of autonomic (parasympathetic and sympathetic) and central nervous systems and reproductive systems. To have introductory practical knowledge on effect of drugs on selected tissues.

**Course Content:**

*Autonomic Nervous System (ANS):* Anatomical and functional organisation of the ANS. sympathetic and parasympathetic systems. Sympathetic transmission - synthesis, storage, release and distribution of noradrenaline. Evidence for noradrenaline as a neurotransmitter. Parasympathetic - synthesis storage, release and distribution of acetylcholine. Neuromuscular transmission. Practical.

*Central Nervous System (CNS):* Anatomy of the CNS. Spinal cord and pathways. Control of muscle movement. Cortical and cerebella control of motor functions. Basal ganglia and control of movement. Transmission and processing of information. The reticular activating system. Wakefulness, sleep and attention - EEG waves. The limbic system and emotions.

*Reproductive System* - Anatomy and physiology of sex organs.

Some selected practical exercises on the above.

**COURSE CODE:** PCL 301  
**COURSE TITLE:** General Pharmacology I  
**UNITS:** 2 + 0 + 3; 0 + 0 + 0 = 3 units

### **Objectives:**

At the end of the course, the student should be able

- (i) To know the theories and principles of drug action
- (ii) To know factors that influence drug action
- (ii) To know the parasympathetic, sympathetic and neuromuscular transmissions and drug that modify these.
- (iv) To appreciate the classification of receptors.
- (v) To know standard practical methods relevant to above.

### **Course Content:**

*Introduction:* Theories of drug action, agonists, antagonists, affinity constants. Therapeutic index. Principles, design and types of bioassay. Routes of drug administration, factors determining absorption, distribution and excretion of drugs. Drug dosage regimen. Introduction to drug metabolism enzyme induction and drug interaction. Introduction to Pharmacokinetics.

*Parasympathetic* - Pharmacology of drug affecting cholinergic nerve transmission. Sites of action - cholinergic receptors and classification. Cholinesterases and anti-cholinesterases.

*Sympathetic* - Pharmacology of drugs affecting adrenergic nerve transmission, storage uptake and release of catecholamine, structure-activity relationships in sympathomimetic amines.

*Neuromuscular Transmission* - Neuromuscular blockers, Structure-activity relationship. Ganglion stimulation of blockade.

Practical Pharmacology

**COURSE CODE:** PCL 302  
**COURSE TITLE:** General Pharmacology II  
**UNITS:** 0 + 0 + 0; 2 + 0 + 3 = 3 units

**Objectives:**

At the end of the course, the student should be able

- (i) To appreciate the pharmacology of drugs used in cardiovascular diseases;
- (ii) To know the genesis and mechanism of action of endogenous compounds (and their antagonist) implicated in allergic reactions.
- (iii) To know the function of different natural and synthetic hormones.
- (iv) To know standard practical methods relevant to 1, and 2 above.

**Course Content:**

Hypertension, types of antihypertensive drugs and mechanisms of action. Diuretics. Vasodilators and antianginal drugs - cardiac glycosides, quinidine and quinine-like drugs, antiarrhythmic drugs. Calcium channel blockers. Autocoids - histamines, 5-hydroxytryptamine prostaglandins and their antagonists. Leukotrienes and their roles in pharmacodynamics. Endocrinology - organisational function of the endocrine system. Gene and membrane active hormones. The hypothyseal hormone and pineal gland. ACTH, Insulin, Glucagon, Parathyroid hormone. Local hormones.

Sex hormones - Pregnancy and lactation, Contraceptive steroids, and fertility regulation.  
*Practical Pharmacology.*

**COURSE CODE:** PCL 401  
**COURSE TITLE:** General Pharmacology III  
**UNITS:** 2 + 0 + 4; 0 + 0 + 0 = 3 units

**Objectives:**

At the end of the course, the student should be able

- (i) To know the basic concepts of drug action in the central nervous system (CNS);
- (ii) To know the rationale for the clinical applications of these drugs in diagnosis, prevention and treatment of diseases of the CNS.
- (iii) To know experimental methodologies in psycho and neuropharmacology.

**Course Content:**

*Central Nervous System Pharmacology* - Central neurotransmitters

Local and general anaesthetics differentiation of action.

*Pharmacology of pain* - aspirin, morphine, mechanism of anti-pyretic anti-inflammatory analgesics, opiates and receptors. Tolerance and dependence.

Anxiety-reducing drugs, sedatives and hypnotics, Antipsychotic drug - Mechanisms - Extrapyramidal side effects - Parkinson's disease, Huntington's chorea, Wilson's disease.

*Antidepressant Drugs* - Depression. Types of antidepressant drugs - tricyclics - typical and atypical. Modes of action and side effects.

*Antiepileptic drugs* - Epilepsy - types of seizures and drugs used in each case. Convulsant agents - strychnine, bicuculine picrotoxin, tetanus toxin. Psychotomimetic drugs.

*Psycho and neuropharmacology practicals.*

**COURSE CODE:** PCL 408  
**COURSE TITLE:** Chemotherapy  
**UNITS:** 1 + 0 + 0; 2 + 0 + 0 = 3 units

**Objectives:**

- (i) To acquaint the student with the theories on the aetiology of cancer, bacterial infections, and common tropical diseases, and the various pathophysiological states associated with these diseases.
- (ii) To acquaint the student with the mechanisms of action of the various chemotherapeutic drugs and their toxic effects;
- (iii) To acquaint the student with the chemistry and the structure-activity relationship of these therapeutic agents;
- (iv) To acquaint the student with the mechanisms of drug resistance, role of immunity in chemotherapy, and the rationale for combination therapy.

**Course Content:**

*Principles of chemotherapy.* The chemistry and mechanism of action of antiparasitic, antimicrobial and antineoplastic agents, antimalarials, and antiviral agents. Trypanocides, schistosomicides and amoebicides. Resistance to chemotherapeutic agents - antimalarials and antibiotics.

**COURSE CODE:** PCL 501  
**COURSE TITLE:** Toxicology  
**UNITS:** 1 + 0 + 0; 2 + 0 + 0 = 3 units

**Objectives:**

- (i) To acquaint the student with the concepts of toxicology and the roles of the various disciplines in toxicology;
- (ii) To acquaint the student with the numerous sources, site and mechanisms of how drugs can and do act as hazards on biological system;
- (iii) To acquaint the student with the types of adverse effects and examples which produce them;
- (iv) To acquaint the student with the toxicological prerequisites for evaluating new drugs in different countries;

- (v) To acquaint the student with the post-marketing surveillance of drugs.

**Course Content:**

General principles of toxicology. Toxicity testing. Organotoxicity - ocular toxicity, nephrotoxicity and hepatotoxicity. Adverse drug interactions and generic components in clinical practice. Agricultural, environmental and industrial toxicology. Principles of antidotal treatment, Carcinogenesis and teratogenesis. Toxicological evaluation of a new drug. Post-marketing surveillance of drugs.

**DEPARTMENT OF PHARMACEUTICS**

*COURSE CODE:* PHA 201  
*COURSE TITLE:* Introductory Pharmaceutics  
*UNITS:* 2 + 0 + 0; 1 + 0 + 0 = 3 units

**Objectives:**

At the end of the course, each student should be able to:

- (i) Calculate correctly the proportions (by weight or volume) of the different ingredients needed to prepare a given volume of any pharmaceutical preparation.
- (ii) Know the scientific basis of the unit operations employed in pharmacy.
- (iii) Recognise the different classes of disperse systems and their application in pharmacy.
- (iv) Enumerate the different types of emulsions.
- (v) Enumerate all the different factors which can affect the stability of emulsions.
- (vi) List the different types of powders and their properties/uses.
- (vii) Enumerate the different types of tablets and their uses.
- (viii) List the advantages of tablets as a dosage form
- (ix) Show understanding of the production of the various types of capsules.
- (x) Recognise the various liquid preparations, their uses in pharmacy, and methods of preparation.

**Course Content:**

- (1) Pharmaceutical Calculations
- (2) Introductory Unit Operations
- (3) Introduction to disperse systems - Emulsions, suspensions, gels and aerosols.
- (4) Introduction to solid dosage forms.
- (5) Introduction to liquid dosage forms - solutions, syrups, elixirs, gargles, douches and aromatic waters.
- (6) Flavouring and colouring of dosage forms.

*COURSE CODE:* PHA 202  
*COURSE TITLE:* Introductory Pharmaceutical Microbiology  
*UNITS:* 1 + 0 + 3/2, 1 + 0 + 3/2 = 3 units

### **Objectives:**

The student at the end of the course must be able to:

- (i) Identify and recognise various forms of bacteria morphologically.
- (ii) Demonstrate phases of growth of bacteria in various environment.
- (iii) Describe the formation of colonies of bacteria,
- (iv) Effectively determine the population of bacteria or fungal spores in a culture.
- (v) Develop and grow micro-organisms in appropriate media and environment;
- (vi) Know the properties of viruses as well as the methods of cultivation.
- (vii) Know the basis of classification;
- (viii) Know common animal parasites and the diseases caused.

### **Course Content:**

- (1) Morphology of bacteria and fungi.
- (2) Cultivation of bacteria and fungi.
- (3) Growth and death in bacteria populations.
- (4) Quantitative analysis of bacterial suspensions.
- (5) Metabolism in microbial systems.
- (6) Viruses.
- (7) Systematics.
- (8) Introductory parasitology.

### **Practical**

Laboratory exposure for handling, identification and cultivation of micro-organisms as well as various experiments to bring out salient properties of micro-organisms.

*COURSE CODE:* PHA 203  
*COURSE TITLE:* Practical Pharmaceutics I  
*UNITS:* 0 + 0 + 3; 0 + 0 + 3 = 2 units

### **Practical**

Practical exercises will involve the basic principles of weighing, mixing, size reduction, preparation of stock solutions and a general introduction to the commonly used dosage forms.



**COURSE CODE:** PHA 301  
**COURSE TITLE:** Liquid and Semi-Solid Dosage Forms  
**UNITS:** 2 + 0 + 0; 2 + 0 + 0 = 4 units

**Objectives:**

At the end of the course, the student should be able to:

- (i) Understand the fundamental properties of disperse systems used in Pharmacy.
- (ii) Know the principles of formulation and the applications of disperse system in Pharmacy - solubilised systems, emulsions and suspensions.
- (iii) Know the major semi-solid dosage forms used in Pharmacy, their common constituents, methods of preparation and their rheological properties.

**Course Content:**

1. Fundamental Properties of Disperse (colloidal) systems.
2. Solubilised Systems - micelle and micellization.
3. Emulsions - Formulation and evaluation
4. Suspensions - Rheological properties, preparation and evaluation.
5. Semi-solid systems in Pharmacy - types, properties, preparation and performance evaluation.

**COURSE CODE:** PHA 302  
**COURSE TITLE:** Pharmaceutical Microbiology I  
**UNITS:** 2 + 0 + 3/2; 0 + 0 + 0 = 2½ units

**Objectives:**

At the end of the course, the student should be able to:

- (i) know the principles, properties and mode of action as well as conditions under which different agents of sterilisation function.
- (ii) predict the effects of sterilisation procedure on the chemical and physical properties of sterilized materials.
- (iii) manage and control the sterilization unit of a hospital or industrial concern.
- (iv) detect any failures in the sterilisation process.
- (v) to choose appropriate control mechanisms for different agents of sterilization.

**Course Content:**

- (1) Sterilization - principles and processes.
- (2) Sterilization – equipment.
- (3) Heat - Dry and moist heat.
- (4) Radiation.
- (5) Filtration.
- (6) Gaseous sterilization.
- (7) Heating with a bactericide.

(8) Biological and chemical controls of sterilization.

(9) Asepsis and Aseptic transfer - environment, products and materials.

*Practical:*

To provide practical exposure for topics covered in PHA 302

*COURSE CODE:* PHA 303  
*COURSE TITLE:* Dispensing  
*UNITS:* 0 + 0 + 3; 0 + 0 + 3 = 2 units

### **Objectives**

At the end of the course, the student should have a sound knowledge of how to dispense drugs to out-patients and to hospital wards.

### **Course Content:**

This course is aimed at offering Pharmacy students a good background on dispensing of drugs to out-patients, and to hospital wards. Students should be able to read prescriptions, compound and dispense the drugs. They should also be able to prepare all extemporaneous preparations and all official dosage forms in bulk for hospital pharmacies.

*COURSE CODE:* PHA 304  
*COURSE TITLE:* Pharmaceutical Microbiology II  
*UNITS:* 0 + 0 + 0; 1 + 0 + 3/2 = 1½ units

### **Objectives:**

At the end of the course, the student must be able to:

- (i) know the sources, treatment and preparation of water as a pharmaceutical vehicle.
- (ii) avoid pyrogens in IV solutions and carry out pyrogen testing.
- (iii) appreciate the need for sterile medicament and medical appliances.
- (iv) determine and evaluate an appropriate sterilisation process for any product.
- (v) determine the necessary packaging.
- (vi) know the principle and basis for sterility testing.

### **Course Content:**

- (1) Water - Sources, treatment and examination
- (2) Pyrogens and pyrogen testing
- (3) Sterile Pharmaceutical products including:
  - (a) Injections
  - (b) Non-injectable sterile fluids
  - (c) Ophthalmic preparations
  - (d) Ligatures

- (e) Sutures and dressings
- (f) Haemostatics
- (4) Sterility Test
- (5) Evaluation of microbial contents of pharmaceutical preparations and products.

**Practical:**

To provide practical exposure for topics covered in PHA 304

*COURSE CODE:* PHA 401  
*COURSE TITLE:* Solid Dosage Forms  
*UNITS:* 1 + 0 + 3; 1 + 0 + 3/2 = 3½ units

**Objectives:**

At the end of the course the student should be able to:

- (i) List the different properties of bulk powders.
- (ii) Carry out correctly particle size analysis on a given sample of powder.
- (iii) Understand the basic principles that govern the formulation of stable solid dosage forms.
- (iv) Devise suitable formulation processes for any solid dosage form whose physico-chemical properties are known.
- (v) Enumerate the different types of tablet that can be produced.
- (vi) Describe in detail the preparation of good quality tablets.
- (vii) Carry out simple evaluation techniques on a given batch of tablets.

**Course Content:**

- (1) *Properties of the solid state:* Crystal form and polymorphism, crystallisation and factors affecting crystal form, relative stability of polymorphs and their bioavailability. Formulation of solid dosage forms, modification of activity of medicament by physical and chemical methods, control of drug release, formulation factors.
- (2) *Micrometrics:* Particle size and size distribution, method of determining particle size and surface area, bulk properties (particle packing, bulk density, porosity), powder flow and its relevance to pharmacy.
- (3) *Tabletting:* Advantages, types tablet additives, manufacture of tablets, tablet machine, coating, standardization procedures, sustained release tablets.
- (4) *Capsules:* Materials for capsules, Method of capsule production, formulation, encapsulated products.
- (5) Microencapsulation.

**Practical:**

Introduction to powder technology, principles of granulation, tabletting, encapsulation and techniques for the preparation of microencapsulates.

**COURSE CODE:** PHA 402  
**COURSE TITLE:** Pharmaceutical Microbiology III  
**UNITS:** 1 + 0 + 3/2; 1 + 0 + 3/2 = 3 units

**Objectives:**

The student at the end of the course must be able to:

- (i) know the properties, mechanisms of action and uses of the different classes of disinfectants and antiseptics that are in pharmaceutical practice.
- (ii) discuss the need for the use of preservatives and make the correct choice under a given set of conditions.
- (iii) design and carry out tests for the evaluation of preservative activity.
- (iv) relate Good Manufacturing Practice (GMP) to the preparation of effectively preserved pharmaceutical products.
- (v) consider the selection of organisms, types of fermenters and adequate media for the most appropriate production process for solvents, antibiotics steroids etc.

**Course Contents:**

- (1) Antimicrobial Agents – Definitions, types and properties.
- (2) Factors affecting activity of antimicrobial agents.
- (3) Evaluation of the activity of such antimicrobial agents.
- (4) Preservation - Contamination sources and hazards and properties of preservatives.
- (5) Preservation of pharmaceutical products including multiphase systems.
- (6) Introduction to genetics.
- (7) Industrial uses of microorganisms - production of solvents, steroids, antibiotics. Choice of media and fermenters.
- (8) Yield of products.
- (9) Factors affecting production.

**Practical**

To provide practical exposure for PHA 402. To include evaluation of disinfectants and antiseptics; effect of various factors on activity and evaluation of antibiotic activity and demonstration of bacterial resistance to antibiotics

**COURSE CODE:** PHA 501  
**COURSE TITLE:** Pharmaceutical Industrial Development and Processing  
**UNITS:** 2 + 0 + 4/2; 0 + 0 + 0 = 2½ units

**Objectives:**

At the end of the course, the student should be able to:

- (i) Identify the requirements of build-up of industrial premises and plants.

- (ii) Enumerate and discuss the principles of Pharmaceutical/Cosmetic processing.
- (iii) Apply the principles of processing in practice.
- (iv) Describe the materials for construction of Pharmaceutical/Cosmetic equipment and plants.
- (v) Describe the functions and handle adequately Pharmaceutical and cosmetic equipment.
- (vi) Prepare and evaluate selected cosmetic products.
- (vii) Discuss the principles of Good Manufacturing Practice (GMP).

### **Course Contents:**

- (1) Requirements of build up of premises and plants. Principles of Pharmaceutical/Cosmetic processing.
  - (a) Heat transfer.
  - (b) Momentum transfer and fluid flow
  - (c) Milling and size separation.
  - (d) Mixing.
  - (e) Classification and Filtration
  - (f) Evaporation and Drying
  - (g) Compaction and Compression
  - (h) Materials of construction of Pharmaceutical/Cosmetic equipment and packing materials.
  - (i) Elements of law for the Industrial Pharmacist.
- (2) Operation of pilot equipment like the:
  - (a) Steam generator.
  - (b) Climbing film evaporator.
  - (c) All types of mixers (liquid/liquid; solid/solid; solid/semi-solid; solid/liquid etc).
  - (d) Single punch and rotary tableting machines.
  - (e) Mills for size reduction.
  - (f) Fluid bed dryer.
  - (g) Plate and frame pillers.
  - (h) Automatic filling and capping machines.

The appropriate use of selected equipment from above in the preparation and manufacture of some cosmetic products such as creams, lotions, shampoos, face and body powders, lipsticks, bath preparations etc will be discussed. The performance and evaluation of such products will also be undertaken.

### **Practical:**

Exposure to various Industrial Pharmaceutical Processing and Quality Control. Industrial visits to selected Pharmaceutical industries in conjunction with

Pharmaceutical Chemistry department. At the end of the course, the student must write a report that will be part of final assessment.

*COURSE CODE:* PHA 502  
*COURSE TITLE:* Pharmaceutical Microbiology IV  
*UNITS:* 0 + 0 + 0; 2 + 0 + 0 = 2units

### **Objectives:**

At the end of the course the student should be able to:

- (i) enumerate the properties and uses of whole blood and blood fractions;
- (ii) give necessary advice on the preservation and uses of whole blood and blood products;
- (iii) show an understanding of the need and use of plasma substitutes;
- (iv) define hapten, antigen and antibody; specific and non-specific defense mechanisms;
- (v) describe humoral and cell mediated immune responses;
- (vi) describe primary and secondary response and relate to immunity to disease;
- (vii) demonstrate an understanding of the role of immunological products in the prevention and cure of diseases.
- (viii) enumerate the cause of hypersensitivity and describe the involvement of drugs in the reaction.
- (ix) recognise causes of allergy and the reactions developed.

### **Course Content:**

1. Blood and Blood Products
  - (a) Properties and uses of whole blood and fractions.
  - (b) Preservation of whole blood and blood fractions.
2. Introductory Immunology
  - (a) Specific and non-specific defence mechanisms.
  - (b) Humoral immunity.
  - (c) Monoclonal antibodies - production and application.
  - (d) Cell mediated immunity.
  - (e) Hypersensitivity.
  - (f) Tissue transplantation.
  - (g) Immunological products – vaccines, immunosera and human immunoglobulins.

**COURSE CODE:** PHA 503  
**COURSE TITLE:** Developments in Pharmaceutical Dosage Form Design  
**UNITS:** 0 + 0 + 0; 1 + 0 + 0 = 1 unit

### **Objectives**

At the end of the course, the student should:

- (i) Understand the various limitations of conventional dosage forms
- (ii) Understand the various attempts to improve upon conventional dosage forms (various stages in the evolution of Pharmaceutical dosage forms) and the principles of formulation of the novel drug delivery systems.
- (iii) be acquainted with the formulation and application of multiple and micro-emulsions in drug delivery systems.
- (iv) be familiar with the use of operation research in dosage form design.

### **Course Content:**

- (1) A brief review of the objectives of an efficient drug delivery system.
- (2) Conventional methods of drug administration and their drawbacks.
- (3) Prodrug, sustained release, repeat action, prolonged release dosage forms (Definition and Formulation) - Controlled release drug delivery systems (Definition, and the philosophy behind their design; classification of controlled release drug delivery systems.
- (4) Targetable drug delivery system.
  - (a) Concept of drug targeting.
  - (b) Particulate materials used in drug targeting
  - (c) Passive and active drug targeting.
  - (d) The use of homing devices to increase tissue specificity.
  - (e) Disease for which these targetable drug delivery systems have been applied.
- (5) Multiple and Microemulsions as drug delivery systems.
- (6) The use of operation research in dosage form design.

## **DEPARTMENT OF PHARMACEUTICAL CHEMISTRY**

**COURSE CODE:** PHC 201  
**COURSE TITLE:** Pharmaceutical Inorganic and Physical Chemistry  
**UNITS:** 2 + 0 + 0; 2 + 1 + 0 = 5 units

### **Objectives:**

At the end of the course, the students are expected to:

- (i) understand the basis of the use of inorganic compounds in Pharmacy as drugs or as tools in analysis;

- (ii) understand the sources of impurities in inorganic pharmaceuticals and the principle behind their limit determinations;
- (iii) show the knowledge of the principles of the physical and chemical behaviour of drugs in neutral, acidic and basic media;
- (iv) have a good understanding of reaction kinetics and their application in pharmacy.

### **Course Contents:**

1. Introduction and relevance to Pharmacy
2. INORGANIC CHEMISTRY - Consideration of properties (including storage, limit test, assay, uses) of inorganic compounds of pharmaceutical importance including coordinate compounds and the importance of metal ions in biological systems.
3. SOLUTIONS
  - (a) Solubility of drugs and distribution phenomena, factors affecting rate of solution.
  - (b) Vapour pressure and distillation.
  - (c) Colligative properties of solutions, isotonic solutions in pharmacy.
  - (d) Phase equilibria: phase rule, phase diagrams for 2 or 3 components systems, Eutectic mixtures.
4. ELECTROCHEMISTRY
  - (a) Acids and Bases: dissociation of acids and bases.
  - (b) Buffers: Mechanism of buffering action, Henderson - Hasselbalch equation, types of buffers, preparation of pharmaceutical buffers.
  - (c) Conductivity of weak and strong electrolytes, solubility measurement from conductivity and conductimetric titrations including application in pharmacy.
  - (d) Potentiometry: Standard electrode potential, concentration cells, pH measurements and potentiometric titrations (principles and application in pharmacy).
5. REACTION KINETICS
  - (a) Order of reactions, factors affecting rate of reaction
  - (b) Pharmaceutical applications of reaction kinetics - shelf-life, accelerated storage test, reactions and decomposition of drugs in solutions.
  - (c) Catalysis and kinetics of enzyme reactions.
6. THERMODYNAMICS:
  - (a) Internal energy and interconversion of energy, first law, enthalpy, exo- and endothermic reactions, reversibility of reactions equilibrium constants and temperature effect.
  - (b) Second law, entropy, heat of reaction and temperature effect, heat of formation, Third law.



- (c) Free energy as criterion for spontaneous reactions, free energy equations for ideal gases, free energy and equilibrium constants and variation with temperature.

**COURSE CODE:** PHC 202  
**COURSE TITLE:** Pharmaceutical Organic Chemistry  
**UNITS:** 2 + 0 + 0; 2 + 1 + 0 = 5 units

### Objectives:

At the end of the course, the students will have knowledge of:

- (i) basic understanding of bond formation and breakage in organic chemistry and functional groups and nomenclature of organic compounds of medicinal interest.
- (ii) the mechanistic explanations of substitution/elimination/addition reaction and be able to recognise molecules of biological and pharmaceutical interest which undergo these reactions.
- (iii) geometrical and optical isomerism, including an appreciation of their effect on biological activity.

### Course Content:

1. INTRODUCTION: A description of the course and its relevance to Pharmacy.
2. BONDING AND STRUCTURE:  
Atomic and molecular orbital hybridisation and covalent bonding, other types of bonding. Bond characteristics and electronic effects i.e. inductive, mesomeric, resonance, delocalisation and aromaticity, bond breakage and stabilisation of positive and negative ions and free radicals.
3. SURVEY OF CLASSES OF ORGANIC COMPOUNDS:  
Concept of functional group and nomenclature of organic compounds with examples of pharmaceutically important compounds in each class.
4. STEREOCHEMISTRY AND THE SHAPES OF ORGANIC COMPOUNDS:  
Isomerism - structural and stereochemical. Tetrahedron carbon and nitrogen, d and l terminology. Optical activity and measurement. Geometry of alkenes and aromatics. cis/trans, E/Z with medical examples.
5. ACIDITY AND BASICITY OF ORGANIC COMPOUNDS  
Various definitions and a discussion on molecular features affecting acidity and basicity including heterocyclic systems. Extensive illustration with drug examples containing relevant functional groups.
6. REACTIVITY OF ORGANIC COMPOUNDS:  
A general review of bond breakage and description of substitution, elimination, addition, rearrangement and free radical reactions.
  - (a) Reaction at sp<sup>1</sup> carbon
  - (b) Reactions at sp<sup>2</sup> carbon
  - (c) Reactions at sp<sup>3</sup> carbon

- (d) Free radical reactions - factors governing formation, related to decomposition of drugs and antioxidants.

**COURSE CODE:** PHC 203  
**COURSE TITLE:** Practical Pharmaceutical Chemistry I  
**UNITS:** 0 + 0 + 3; 0 + 0 + 3 = 2 units

**Objective:**

To complement the theoretical principles involved in PHC 201 and 202 and provide instructional laboratory classes to general analytical methods.

**Course Content:**

Laboratory classes involving volumetric analysis, functional group test, limit tests, colorimetric, refractometric and potentiometric analysis of pharmaceutical substances. Examination will be by continuous assessment.

**COURSE CODE:** PHC 301  
**COURSE TITLE:** Radiopharmacy and selected Physicochemical Methods of Analysis  
**UNITS:** 1 + 0 + 0; 1 + 1 + 4 = 4 units

**Objectives:**

At the end of the course, the students are expected

- (1) to understand the sourcing, handling, storage, use and disposal of radiopharmaceuticals.
- (2) to be able to carry out spectroscopic and polarographic analysis of medicinal products.

**Course Content:**

1. RADIOPHARMACY

Types of radiation and production of radioisotopes. Radioactive decay. Detection and measurement of radioactivity. General application of radioactivity. Biological effects and handling of radioactive materials, properties, uses and synthesis of selected inorganic and organic radionuclides used in diagnostic and therapeutic medicine, disposal of radiopharmaceuticals.

2. POLARIMETRY AND REFRACTOMETRY - Principles and applications in pharmacy.

3. ELECTROANALYTICAL METHODS - Polarography, principles and applications; Amperometric titrations.

4. SPECTROSCOPY

The principles, instrumentation and applications of spectroscopic techniques e.g. UV, IR, Fluorimetry, NMR, MS.

## 5. PRACTICAL

Laboratory classes will involve chemical and spectroscopic characterisation of pharmaceuticals. In the case of spectroscopy students will have opportunity to use the UV and IR but the exposure will be backed up mostly with dry laboratories.

<i>COURSE CODE:</i>	PHC 401
<i>COURSE TITLE:</i>	Medicinal Chemistry I
<i>UNITS:</i>	2 + 0 + 4; 0 + 0 + 0 = 3 units

### Objectives:

At the end of the course, the students are expected to:

- (i) understand the mechanism of action of drugs at molecular level.
- (ii) explain the relationship between molecular structure and biological action.
- (iii) show knowledge of the principles and relevance of photochemistry to pharmacy.
- (iv) understand the drug factors such as polarity, acidity, shape and size that affect drug-receptor interactions.

### Course Content:

1. **SELECTED METHODS IN MEDICINAL CHEMISTRY**  
Exposure to the various classes of oxidising and reducing reagents and factors governing choice of method.
2. **HETEROCYCLIC CHEMISTRY:**  
Chemistry of heterocyclic compounds (i.e. properties and reactions) of 5- and 6-membered rings having one or more heteroatoms.
3. **PHOTOCHEMISTRY:**  
General principles, characteristics and fate of excited species with emphasis on their synthetic applications and relevance to drug product stability. Photostability testing of drugs and selected photochemical processes of biological interest e.g. vision, bioluminescence, vitamin D. photosynthesis and development of photochemical therapies in medicine.
4. **PHYSICOCHEMICAL PRINCIPLES OF DRUG ACTION AND RECEPTOR SITE THEORIES**  
Physicochemical factors which affect drug action, for example, pKa, ionisation etc. and receptor theories. Conformation, Ring shapes C<sub>3</sub> – C<sub>7</sub> with examples. Overall discussion of effect of stereochemistry on biological activity.
5. **STEROIDS** - Synthesis, stereochemistry and assay of various classes of steroids and steroid hormones.
6. **THE VITAMINS** - Synthesis, stereochemistry and assay of various vitamins.
7. **Practical:**  
Laboratory classes involving application of selected synthetic (including photochemical) methods to the synthesis of pharmaceutical agents, selected chemical assay procedures.

*COURSE CODE:* PHC 402  
*COURSE TITLE:* Medicinal Chemistry II  
*UNITS:* 0 + 0 + 0; 2 + 0 + 4 = 3 units

**Objective:**

At the end of the course the students are expected to be able to appreciate the structural features and demonstrate knowledge of the sourcing, stability, assay and structure activity relationships of drug acting on the CNS, ANS, antihistamines and analgesics in current use.

**Course Content:**

Selected examples from each of the groups of drugs below will be discussed. Emphasis will be placed on the development from natural products where appropriate, chemical stability, syntheses, assays and structure - activity relationship.

1. DRUGS ACTING ON THE CNS:
  - (a) General anaesthetics, sedative hypnotics, anticonvulsants, tranquilisers and antidepressants.
  - (b) Narcotic analgesics.
2. ANTIPYRETIC ANALGESICS: including non-steroidal anti-inflammatory agents
3. DRUGS ACTING ON THE ANS: The sympathomimetic amines and antihistamine including the development of antagonists at H<sub>1</sub> and H<sub>2</sub> receptors. Local anaesthetics
4. PRACTICAL:  
Selected synthetic methods in medicinal chemistry as well as selected assay procedures.

*COURSE CODE:* PHC 501  
*COURSE TITLE:* Principles of Drug Development and Design  
*UNITS:* 1 + 0 + 0; 0 + 0 + 0 = 1 unit

**Objective:**

At the end of the course, the students are expected to understand the role of medicinal chemistry in the discovery and development of therapeutic agents.

**Course Contents:**

- (1) Search for 'leads' as a drug designer
  - from natural products
  - application of hypothesis
  - serendipity or accidental
  - drug metabolites
  - side effects of existing drugs
  - mass screening for biological action

- (2) Molecular modifications and correlation of chemical structure with biological activity.
- (3) Quantitative structure-activity relationship (QSAR) in the design of new drugs.
- (4) Pro-drug/Soft-drug, antimetabolite and bio-isosteric approaches to drug design.

**COURSE CODE:** PHC 508  
**COURSE TITLE:** Pharmaceutical Analysis and Drug quality control  
**UNITS:** 1 + 0 + 6; 1 + 0 + 0 = 4 units

### **Objectives:**

At the end of the course, the students are expected to:

- (i) know the sources of quality variation
- (ii) understand the testing programmes and methods for assuring quality and compliance with official standards and specifications.
- (iii) appreciate the tremendous professional, social and legal responsibilities associated with the assurance of product quality.

### **Course Content:**

- (1) General principles of drug quality control and assurance systems
- (2) Structural organisation and functions of a Quality Control Department.
- (3) Sources of impurities in pharmaceutical substances, sources of quality variation of pharmaceutical products.
- (4) Environmental control of manufacturing area.
- (5) Monographs and specifications for drugs and drug products. Critical evaluation of the Pharmacopoeias including the African Pharmacopoeia and the role of WHO in drug quality assurance.
- (6) Application of chemical and physicochemical analytical techniques in purity determination, identification and quantitation of drugs in pharmaceutical and radiopharmaceutical preparations, including multicomponent formulations from a regulatory and quality control standpoint.
- (7) Evaluation of crude drugs
- (8) Microbiological evaluation of sterile and non-sterile pharmaceutical products.

### **Practical:**

Practical work will involve comprehensive analysis of some selected raw materials and finished drug products using a combination of analytical principles treated in the theory. It will be supplemented by visits to local manufacturing units where the student may examine the practice of quality control.

## PRIZES IN THE FACULTY FOR THE B. PHARM. DEGREE

### A. NON-GRADUATING

No	Citation
1	<b>L.Duro-Emmanuel Prize:</b> For the best all round student in Part II B. Pharm. Degree Examination
2	<b>L.Duro-Emmanuel Prize:</b> For the best all round student in Part III B. Pharm. Degree Examination
3	<b>L.Duro-Emmanuel Prize:</b> For the best all round student in Part IV B. Pharm. Degree Examination
4	<b>Odelola Prize:</b> For the best student in PCG 401:Herbal Remedies in Traditional Medicine& PCG 402: Nigerian Medicinal Plants
5	<b>Juli Pharmacy Prize:</b> For the best student in the Pharmacy management courses in Part IV B. Pharm. Degree Examination
6	<b>Adeola Odusina Prize:</b> For the best student in Forensic Pharmacy & Pharmacy Ethics

### B. GRADUATING STUDENTS

No	Citation
1	<b>Faculty Prize:</b> For the overall best performance in the Final B. Pharm. Degree Examination
2	<b>Professor Festus Adio Ogunbona Prize:</b> For the student with overall best performance in the B. Pharm. Degree Examination
3	<b>Francis Omoseyin Ogunbamila Prize:</b> For the student with overall best performance in the B. Pharm. Degree Examination
4	<b>L. Duro-Emmanuel Prize:</b> For the best all round student in Part V B. Pharm. Degree Examination

5	<b>Ciba Prize:</b> For the overall best performance in the Part V B. Pharm. Degree Examination
6	<b>Glaxo-Allenbury Prize:</b> For the second best student in the Part V B. Pharm. Degree Examination
7	<b>George Iketubosin Prize:</b> For the student with the best performance in Pharmaceutical Chemistry in the Part V B. Pharm. Degree Examination
8	<b>Dean's Prize:</b> For the best final year dissertation in the Faculty.
9	<b>Synergy Health Care Limited Prize:</b> For the student with the best performance in Clinical Pharmacy and Pharmacy Administration in the Part V B. Pharm. Degree Examination
10	<b>The Boots Pure Drug Prize:</b> For the best student in Pharmaceutics in the Part V B. Pharm. Degree Examination
11	<b>Femi Oyewo Prize:</b> For the best student in Clinical Pharmacology.
12	<b>Bunmi Onayade Prize:</b> For the best student in Pharmacognosy Project in Part V B. Pharm. Degree Examination.
13.	<b>Late Professor Otasowie Eghe Ukponmwan Prize:</b> For the Best student in Pharmacology in the Final Year B. Pharm. Degree Examination
14	<b>Pharmaceutical Society of Nigeria, Board of Fellows' Prize:</b> for the best student in Pharmacognosy

## **DRESS CODE IN THE UNIVERSITY**

- (a) Dressing which is sexually provocative and exposes vital parts of the body that are supposed to be hidden (such as the chest, navel and thighs) are prohibited.
- (b) The identity of all students must, at all times, be visible i.e. their face must be fully visible. The form of dressing that obscures identification poses serious security problem.
- (c) Individual Faculties are required to draw up additional guidelines that are relevant to their academic activities.

## **DRESS REGULATIONS FOR PHARMACY STUDENTS**

1. Dressing should be neat and decent\*  
\*Decent excludes clothing that are too short, clinging to or that indecently expose some parts of the body.
2. Jewellery should be kept to a minimum. Ankle chains are not allowed.
3. Presentable footwear should be worn. This excludes bathroom slippers.
4. All 'Jeans' wear not acceptable.

## **LABORATORY DRESS CODE**

1. A clean, white front-buttoned Laboratory coat over garments of suitable length (i.e. not dragging on the floor) must be worn
2. Where long sleeved cloths are worn, lab coats must be long sleeved
3. The student's name-tag must be worn on the lab coat
4. Fingernails should be kept to a minimum
5. Jewellery should be kept to minimum
6. For female students, long hair-do should be tied up or clipped together (in the laboratory)
7. If any head covering is to be worn, its material design and method of wear should ensure the individual and other's safety in the laboratory
8. Footwear excludes high-heeled shoes.

\*Veils do not meet the professional dress code or the Faculty's requirement for safety in the laboratories. They are therefore not allowed in the laboratory.



## **GENERAL REGULATIONS GOVERNING COURSES LEADING TO FIRST DEGREES**

1. To be eligible for admission to a degree of Bachelor in one of the Faculties of the University, a candidate must have:
  - (a) satisfied (in addition) the requirements for admission to the University;
  - (b) satisfied, in addition, the Faculty or Department requirements for entry into the approved course of study relating to the degree;
  - (c) followed the approved course of study for the prescribed period;
  - (d) passed the required examinations set out in the detailed degree regulations for the several faculties;
  - (e) paid all prescribed fees as and when required; and
  - (f) complied with such other regulations and requirements as may be prescribed.
2. Approved courses of study and syllabuses of subjects for the examinations under these regulations and the number of papers in each subject are those approved by Faculty and Senate. Approved courses shall also include such lectures, tutorials, seminars, laboratory classes, field work, as are prescribed by departmental regulation and such written work as the Department concerned shall require.
3. A candidate shall not be deemed to have followed any approved course of study unless the Head of Department concerned certify that his attendance and performance have been satisfactory.
4. A candidate whose work or progress is considered unsatisfactory may be required by Senate, on the recommendation of the appropriate Faculty to withdraw from the University or repeat any part of his course before admission to an examination. Failure in an examination, including a sessional examination, may be regarded as evidence of unsatisfactory progress.
5. The duration of a course of study for a first degree shall normally be not less than four academic years. A student may be permitted to extend the period of study prescribed for a degree on grounds of absence from the University or inability to sit for the examination on ground of ill health or other reasons approved by Senate.
6. The Senate may permit the following persons to proceed to a first degree with exemption from the whole or part of the entry requirements to a degree course and in approved cases may allow them to complete the requirements for the award of a degree in not less than two academic years.

- (a) an undergraduate of an approved University who is permitted to transfer to Obafemi Awolowo University.
  - (b) a graduate of an approved University.
7. A graduate of the Obafemi Awolowo University, may on the recommendations of the appropriate Faculty Board, proceed to another first degree of the University under such conditions including a period of study as Senate may decide in each case.

### **Admission to Degrees**

1. After the report of the examiners has been approved by Senate, successful candidates shall be admitted to the degree of Bachelor at the Graduation ceremony for the award of degrees, and thereafter issued with diplomas under the common seal of the University.
2. In exceptional cases, degree may be conferred upon persons in absentia with the approval of the Senate.

### **Aegrotat Degrees**

1. A candidate who has completed his course of study and who has been absent through illness from not more than half the papers of the final examination for a first degree may apply to the University for the award of aegrotat degree in accordance with the following provisions:
  - (a) Application from or on behalf of a candidate must be made to the Registrar not later than ten days after the termination of the written examination, accompanied by a certificate of candidate's inability to take the examination given by a medical practitioner approved for the purpose by the University.
  - (b) Senate may, on a report from the Board of Faculty concerned and upon such further evidence and subject to such conditions as it thinks fit, award a degree provided that the degree be awarded without distinction, class or division.
  - (c) Holders of an aegrotat degree are not permitted to re-enter for the same examination but may apply for permission to proceed to a second or higher degree on complying with the regulations for such a degree.

## **GENERAL INFORMATION – ADMISSION OF STUDENTS**

### **Application Procedure**

Applicant seeking admission to a degree course in the University must be qualified for admission before the beginning of the session in which they wish to enter.

Applicants may seek entry to:

- (a) Part I (First Year) in any Faculty to pursue a four to six years degree programme in their chosen area, or
- (b) Part II (Second Year) with exemption from Part I

All applicants must meet both:

- (i) the general entrance requirements, and
- (ii) additional Faculty or departmental course requirements.

Students intending to enter the University are advised to obtain information from the University about entry requirements to ensure that they will have satisfied the requirements by the time they apply for admission.

Applications for courses leading to first degree must be made on the prescribed form obtainable from the Registrar, Joint Admissions and Matriculation Board, Suleja Road, Bwari, P. M. B. 189, Garki, Abuja

### **Full Time Undergraduate Courses**

B.A., B.A. (Ed), B.Sc., B.Sc. (Ed), B.Sc. (Phys. Ed.), B.Ed. (Pry. T. Ed.), B.Sc. (Accounting), B.Sc. (International Relations), B.Sc. (Local Govt. Studies), B.Sc. (Pub. Admin.), B. Agric., B.Sc. (Nutrition), B.Sc. (Agric. Eng.), B.Sc., (Chem. Eng), B.Sc. (Electronic and Electrical Eng), B.Sc. (Mat. Sc. & Engineering) B.Sc. (Mechanical Engineering), B.Sc. (Civil Engineering), B.Sc. (Architecture), B.Sc. (Town Planning), B.Sc. (Building), B.Sc. (Quantity Surveying), B.Sc., (Estate Management), B.Sc. (Food Science and Technology), B.Sc. (Soc. Sc.), B. Pharm., LL.B, MB ChB., B.Ch.D., B.M.R. (Physiotherapy), B.N.Sc., B.Sc. (Environ. Health).

### **Higher Degree and Postgraduate Courses**

Applications for admission to research or post graduate courses must be made on the prescribed form obtainable from the Postgraduate College of the University.

Candidates should state the course required, their qualifications and other evidence which qualifies them, for undertaking advanced study or research and give the names of two referees.

## **Matriculation**

A student, admitted to the University for the first time to read for a degree will be required to sign the register of matriculated students and to matriculate at a formal ceremony which will take place in the Assembly Hall.

## **Registration**

All students, including postgraduate students, are required to register on admission to the University and thereafter at the beginning of each semester in accordance with the rules made from time to time by the University.

A student shall be deemed to have begun his course of studies on the date of his registration for that course. Only exceptionally and with the special permission of the Register, will a student be permitted to register after the appointed date. Registration for a course includes automatic registration for the examination in that course.

The procedure of registration shall include the payment of due fees and other charges.

## **Residence**

A student is deemed to have been in residence if he has throughout a prescribed period fulfilled all the requirements to this course of study to the satisfaction of the Head of his Department and the Dean of the Faculty. The period of residence for first degree is normally four years and during this period students are required to be regular and punctual in their attendance at such instruction as may be prescribed, and they will be allowed to remain in residence only so long as they make satisfactory progress in their course of study and comply with all the requirements of the University.

If a student is prevented by illness or other urgent cause from fulfilling the requirements of his course of study for a semester, the Senate may grant him grace provided that no more than one semester is so granted to any individual in any one academic year.

A student who has already gained a first degree in any Faculty may not seek admission to an additional first degree in that Faculty without the previous consent of Senate.

## **Discipline**

The University expects student to behave at all times in a manner creditable to the good name of the University. Regulations for the maintenance of discipline and order in the University are published from time to time, and students are required to take notice of these regulations and to observe them. Students should note that regulations relating to Halls of Residence and the University library have the same force as University regulations and any breach of these regulations may be dealt with as a breach of University discipline.

A student will also be required to make good to the satisfaction of the Vice-Chancellor any damage he may cause to University property.

### **Conferment of Degrees**

No person may describe herself/himself as holding a degree or diploma or certificate of the University unless such qualification has been awarded at a graduation ceremony or by resolution of Senate. A degree shall ordinarily be conferred upon a candidate presented fit in person at a Graduation Ceremony unless the Vice-Chancellor considers that adequate reasons for absence have been produced, in which case the degree may be granted in absentia.

### **Academic Dress and Colours of the Faculties**

Academic dress in the form prescribed by Senate shall be worn at all Convocation and at such times on such occasions as the Senate any direct from time to time. The following is the prescribed form of academic dress.

**Undergraduate** - A Peacock blue gown of approved pattern and mortar board in the same colour

**Graduate** - A Panama Blue gown of approved pattern with hood and mortar board in the same colour. The hood also lined with Faculty colour.

### **The colours of the Faculties are:**

Faculty of Administration	-	White
Faculty of Agriculture	-	Lime Green
Faculty of Arts	-	Light Blue
Faculty of Education	-	Violet
Faculty of Environmental Design and Management	-	Pink
College of Health Sciences	-	Blood Red
Faculty of Law	-	Silver Grey
Faculty of Pharmacy	-	Bluish Violet
Faculty of Science	-	Rust
Faculty of Social Sciences	-	Ordinary Mustard
Faculty of Technology	-	Orange

## **Masters and PhD Colours**

**(a) M.A./M.Sc./LL.M./M.P.A./M.B.A.**

Gown: Ife Blue gown with Scarlet sleeve.

Hood: Ife blue outside with Faculty colour inside.

Hat: Mortar Board with boat-shaped bottom and round flat top with scarlet cord and tassels.

**(b) M.Phil.**

Same as above but the Gown will have the distinction of one Blue cross band of thick fur on the sleeve.

**(c) PhD**

Gown: A Scarlet gown body, Ife blue bell shaped sleeve with three cross bands of Blue thick fur.

Hood: Scarlet with Faculty colour inside.

Hat: Ife Blue velvet Bonnet with gold cord and tassels.



## **GREAT IFE ANTHEM**

Great Ife, Great Ife  
Africa's most beautiful campus  
conscious, vigilant progressive  
Aluta against all oppression  
Forward ever, backward never  
For learning and culture, sports and struggle  
Great Ife! I love you  
There is only one Great Ife in the universe  
Another Great Ife is a counterfeit  
Great!! Great!!! Great!!!!  
Great Ife