

**DEPARTMENT OF BIOCHEMISTRY  
FACULTY OF BASIC MEDICAL SCIENCES  
COLLEGE OF HEALTH SCIENCES  
UNIVERSITY OF JOS**



**UNDERGRADUATE  
STUDENT HANDBOOK**

*A publication of the*  
**Department of Biochemistry  
University of Jos, Jos, Nigeria**

**2021**

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# FOREWORD

This prospectus is a summary of the academic programmes offered in the B.Sc. Biochemistry Programme in the Department of Biochemistry, Faculty of Basic Medical Sciences, University of Jos, Nigeria. It contains the objectives, admission requirements, course contents/curriculum, examination regulations, students' evaluation as well as the staff of the Department.

The Department has important role to play in the conduct of research and manpower development of the nation in the areas of Health, Agriculture, Biotechnology, Science and Technology Education. Biochemistry spreads through other disciplines so also these disciplines permeate biochemistry. This explains the number of other programmes the department serves which include B. Agricultural Sciences, BMLS, B.Sc. Microbiology, B.Sc. Nursing, B. Pharmacy, Veterinary Medicine, B.Ed. PHE, etc.

I therefore recommend this prospectus to all students and prospective students of Biochemistry and Biochemistry –related courses and programmes.

Training in Biochemistry, like any other course in the University of Jos, has a wholistic outlook. Students must be found to be worthy in character and learning to be awarded the degree in Biochemistry. The Department will continue to impart the desired knowledge and moral values and to maintain high academic standard based on the academic philosophy of the University. Students must therefore work hard to earn a degree that they will be proud of and subsequently be good ambassadors of the Department and the University at large. Remember, the motto of the University is *Discipline and Dedication*.

**Professor Ishaya Y. Longdet**  
**Head of Department**

# **GENERAL INFORMATION**

## **1.0 HISTORY OF THE UNIVERSITY**

The University of Jos began as a campus of the University of Ibadan in November, 1971 with the appointment of Professor E.A. Ayandele as its first acting principal. The first site was the present township campus located along Murtala Mohammed Way, Jos. The first students were admitted in January, 1972 as pre-degree students. The same year, the land which turned to be the Bauchi Road Campus accommodating all the faculties, the central administration, other academic units and part of the Library, at the beginning, was acquired.

In October 1975, the Federal Military Government announced the establishment of seven new Universities and University colleges, including the University of Jos. Prof. Gilbert Onuaguluchi was appointed the first Vice-chancellor, since then the University has undergone enormous progress. There are currently twelve faculties – Arts, Agriculture, Education, Engineering, Environmental Sciences, Law, Management Science, Medical Sciences, Pharmaceutical Sciences, Natural Sciences, Social Sciences and Veterinary Medicine. Other academic units include the Centre for continuing Education, Centre for Research Development Division of General Studies, the Department of Remedial studies, Centre for Conflict Management, a School of Postgraduate Studies, Centre of Entrepreneurship, Centre for Intellectual Property, Centre for Biotechnology and Genetic Engineering, etc.

### **University Governance**

The University of Jos is an autonomous public institution with general function of providing liberal and higher education and encouraging advancement of learning throughout Nigeria and the world at large. The University is made up of the Council, Chancellor, Pro-Chancellor, Vice-Chancellor, Senate, Congregation,

Graduates and undergraduates of the University and all other persons who are members of the University community in accordance with the provisions of the University of Jos Act 1979.

### **Objectives of the University**

The objectives of the University include the following:

- (i) To encourage the advancement of learning and to hold out to persons without distinction of race, creed, sex or political conviction the opportunity of acquiring a higher and liberal education.
- (ii) To provide courses of instruction and other facilities for the pursuit of learning in all its benches and to make those facilities available on proper terms to such persons as are equipped to benefit from them.
- (iii) To encourage and promote scholarship and conduct research in all fields of learning and human endeavour.
- (iv) To relate its activities to the people of Nigeria and the economic needs of the people of Nigeria and
- (v) To undertake any other activities appropriate for a University of highest standard.

### **1.1 A BRIEF HISTORY OF THE DEPARTMENT**

The Department took off in October 1975 (1975/76 academic session) when the University and the Faculty of Medical Sciences were established. It started as the Department of Human Chemistry which was later on translated to be the Department of Chemical Pathology and Biochemistry. After sometimes, Chemical Pathology was moved to JUTH and Biochemistry remained as a Department in the preclinical Sciences. The Department initially took off as a service Department i.e. teaching students of Medicine, Pharmacy and Medical Laboratory Sciences as well as running the Postgraduate Programmes. In 1997 the regular B.Sc. Biochemistry programme was established. The first set of the



Bachelor Degree programme graduated in 2003. Ever since, the Department has graduated many graduates and Postgraduate Students.

At first, the Department has 3 laboratories 2 teaching laboratories and one research laboratory established by the Japanese International Cooperation Agency (JICA) in 1986.

The first Head of Department was a Briton, Dr. Brian Cowlshaw until his demised in 1981. Since then the succession to the Headship of the Department has progressed as follows, Dr. K.K. Sen (1981-1984); Prof. G.E. Anekwe (1984-1988); Prof. Z.S.C. Okoye (1988-1990); Prof. G.E, Anekwe 1990-1994); Prof. G.A. Ubom (1994-2001); Prof. G.I. Adoga (2001-2006); Prof. (Mrs) M.D. Solomon (2006-2009); Prof. Z.S.C. Okoye (2009-2011), Dr. C. D. Luka (2011 to 2016) and Professor I.Y. Longdet (2016 - 2021). Today, the staff strength of the Department stands at 22 permanent academic staff 17 technologists and 3 Secretariat staff.

## **1.2 PHILOSOPHY**

Biochemistry or chemistry of life, is a life science that is anchored on the fact that living organisms (i.e., plants, animals, microbes) are chemical entities – constructed of chemical building blocks and powered and maintained by chemical substances (chemical fuels/nutrients) through chemical reactions and processes with intrinsic capability to manufacture needed chemical substances (building blocks, accessory chemicals). It is a science that seeks to understand the living organism and its behaviour and activities, in health and sickness, from the knowledge of its body chemistry and chemical properties. By virtue of the fact that the living organism is indeed a chemical entity, biochemistry is an inter disciplinary science, being a basic science to all the life science disciplines – medicine (human and veterinary), pharmacy, agriculture and agricultural sciences, food science and technology, etc., and their allied engineering disciplines - and applied science to applied life science disciplines such as industrial biology (extractive, manufacturing) and analytical biological sciences (e.g. medical laboratory science, forensic science). In the past 50 years or so, the frontiers of

knowledge in the discipline of biochemistry has advanced so tremendously as to give rise to several new sub-disciplines, notably, cell biology, molecular biology and biotechnology/genetic engineering, some of which have become independent disciplines of their own (e.g. Cell Biology). It is in acknowledgement of this transition that the discipline is today denoted as Biochemistry and Molecular Biology. Incidentally, molecular biology (the biology of genetic information-bearing macromolecules, nucleic acids), is the hub of contemporary advances in knowledge and applications of biochemical science: It supplies the information that feeds an emergent global economy that is based on biotechnology, hence, its inclusion in the present revised curriculum.

The biochemistry degree curriculum, by its philosophy, is therefore designed to equip the student with factual knowledge of the basic tenets of the life science of biochemistry and the ability to relate the body state, behaviour and activity of a living organism, especially those of medical, agricultural and industrial importance, to its life chemistry. It is also designed to expose the student to the diversity of applications of the knowledge of biochemistry to his life and the national and global economy with the attendant diverse career opportunities derivable from it, including the emergent opportunities provided by molecular biology and allied industry.

### **1.3 VISION**

To attain a height of excellence in Training and Research in Biochemistry and Molecular Biology.

### **1.4 MISSION**

To produce graduates that are morally sound, fully equipped with comprehensive theoretical knowledge as well as practical and entrepreneurial skills for meaningful contribution in the development of a robust economy.

## **1.5 OBJECTIVES**

- To introduce students to the diverse areas of Biochemistry and reinforce the principles of basic sciences in modern day biotechnological practice and research,
- To provide opportunity for participation in biochemistry research projects. This may be in the form of research experience and complete research training
- To promote independent learning skills early in medical and biochemistry training.
- Provide an early and healthy environment where Faculty role models stimulate students to pursue academic careers in Biochemistry
- To provide experience where basic science and clinical sciences interrelate

## **1.6 ADMISSION REQUIREMENTS**

Admission to the course is either by UTME or direct entry.

1. Candidates for the B.Sc (Hons) degree programme may be considered for admission by passing the Universities Matriculation Examination (UME) or University of Jos Remedial programme after having obtained the Senior Secondary School Certificate with 'O' level credits which must include Biology, Chemistry, Physics, English and Mathematics. Selection of candidates is done by the Joint Admission and Matriculation Board (JAMB). Students with "A" level Certificate are also considered through Direct Entry admission.
2. Students wishing to study Biochemistry must be required to register for the stipulated compulsory 100 and 200 level courses in chemistry, physics, biology, Mathematics, Computer Science, Entrepreneurship and General Studies (GST). These compulsory courses are prerequisites for

registration of other biochemistry courses which commence at 200 and 300 levels respectively. Owing to the interdisciplinary nature of biochemistry there is little room for electives from 100 to 200 levels. The fourth year or 400 level courses consists of compulsory courses which include seminar on selected topics and a dissertation based on a research project. Students are advised to study carefully the prerequisites on each course registered for.

3. Admission to the Bachelor's Degree programme may be by direct entry to the three year standard programme upon obtaining 'O' level SSCE or GCE with credits in minimum of five subjects including English Language, Biology, Chemistry, Physics and Mathematics in addition to "A/L" GCE passes in Biology and chemistry. An 'A' level pass in Physics or Mathematics will be an advantage. Candidates are selected by JAMB.
  
4. Students in the Department of Remedial Studies, University of Jos who pass their end of session examination may be admitted into the B.Sc. (Hons) Biochemistry degree programme.

#### 1.7 **REGISTRATION**

All new students on arrival at the university should proceed for registration as determined and directed by the registry. During registration for individual courses, students must ensure that they write their full names as initials are not allowed by the University. Matriculation numbers must be written legibly too. In addition to the series of on-line registration, students are also required to proceed to

- i. University Library – for registration
- ii. University Health Centre- for registration and medical examination

## 1.8 MATRICULATION/INDUCTION CEREMONY

Every new student must be matriculated before he/she is recognized as having entered the academic community of the University. At the ceremony, students are expected to take the matriculation oath which reads:

“I solemnly undertake and swear to observe and respect the provisions of the University of Jos law and statutes, Ordinances and Regulations Lawfully made there under which are enforced, which shall, from time to time, be brought into force”.

All students are required to be formally dressed (i.e. complete with academic gowns) during the induction ceremony

Matriculation marks the end of student’s registration. Students are usually issued with matriculation numbers with which they will obtain identity cards from the security Department/MIS.

## 1.9 ORIENTATION OF NEW STUDENTS

The orientation of new students to the University usually takes place in the first month after registration. The orientation programme is organized by the Students Affairs Division. In co-operation with other Departments, the programme is intended to enable new students settle down and adjust to University life.

## 1.10 DEFINITION OF TERMINOLOGIES AND CONCEPTS

**A programme** is a combination of courses prescribed by the department to be taken in a progressive manner graduated into 100 to 400 level and must be completed in a minimum of eight semester (4 years) and maximum of twelve semesters (6 years) for the B.Sc.

A student at the beginning of the programme and working at the maximum permitted rate will normally take 100 level courses in the 1<sup>st</sup> year of study, 200 level courses in the second year of study and so on.

Students joining the programme through Direct Entry Admission will normally start with 200 level courses and in some special cases with 300 level including GST courses.

A student who spends the maximum prescribed period of 6 years for the B. Sc programme shall be required to withdraw whatever the actual grade he may have earned in the examination.

### **1. Course**

A course is a subject of study consisting of only one syllabus lasting one semester and associated with a single or two examination paper(s) and as per need a course may last for more than one semester, provided that such a course is divided into two parts, either part of which carried equal credit weighting and lasts for only one semester and is examinable at the end of the semester.

### **2 A Compulsory Course (Core Course)**

This refers to a course that is compulsory and therefore must be registered for and passed before a student graduates. Where such a course is a pre-requisite, a student must pass it before he/she is allowed to register for the higher course to which it is a pre-requisite.

### **3 An Elective Course**

A course that is not compulsory which may not necessarily be from the department, and may be taken along with the core courses to broaden the intellectual base and interdisciplinary perspective of the students so long as the

maximum students are normally restricted to offer elective from Biochemistry, Chemistry, Physics, Mathematics, Microbiology, Zoology and Botany Departments. This is normally allowed at 200 & 300 level. Electives outside the Biochemistry Department at 400L are not allowed.

NB: All courses in 100L for B.Sc. Biochemistry students are compulsory (i.e. there is no elective at 100L B. Sc Biochemistry. All courses for 100, 200, 300 and 400 levels can be accessed on-line. The MIS handles this for all departments in the University of Jos.

#### **4 Pre-Requisite Course**

Pre-requisite course is a course which must be taken and passed before the student can be allowed to register for a higher level course (i.e. passing a pre-requisite is a pre-condition unto registering for a higher course).

#### **5 Add- And-Drop-Courses**

To add-and-drop courses implies that a student may add onto, or drop courses already registered for in a session, provided the sum total credit load for the session does not exceed the stipulated maximum (in the former case) nor fall short of the stipulated minimum (in the latter case), and provided not more than 25% of the course has already been taken, at any rate not later than one month after the semester would have started.

NB: A student may use the add-and-drop form usually in the second semester to register for a course, the prerequisite of which has been passed in the first semester provided the added course is a second semester course and provided the total credit load carried by the student does not (even after this addition) exceed the maximum stipulated 48 credit in a session.

## **6 Credit unit**

Credit unit is the weight attached to a course depending on the number of lecture hours for the course per week per semester. For example, one credit unit is equivalent to one hour of lecture per week per semester or three hours of practical work per week” per semester.

Six months of organized industrial training under the Students Industrial Work Experience Scheme (SIWES) is equivalent to 6 credit unit.

### **2.0 STUDENT’S EVALUATION**

#### **2.1 THE COURSE CREDIT SYSTEM**

This should be understood to mean a ‘quantitative system of organization of the curriculum in which subject areas are broken down into unit courses which are examinable and or which students earn credit(s) if passed’. The courses are arranged in progressive order of difficulty or in levels of academic progress, e.g. 100 Level or year 1 courses are 100, 101, etc. and the courses are assigned weights called credit units.

Credit units consist of specified number of student-teacher contact hours per week per semester, Credit units are used in two complementary ways, as a measure of course weighting and the other, as an indicator of student work load.

#### **2.2 STUDENT’S WORK LOAD**

Although the details of application of the course credit system to the various academic programmes have been covered by Minimum Academic Standards in



various disciplines, the following is the approved guideline for the Nigerian University System.

Every full-time student will be required to register for a minimum of 18 credit units and a maximum of 24 credit units per semester except for students on field experience/industrial attachment

As there is considerable variation in the modes of application and interpretation of Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) as a means of computing mean score of a student, there is therefore the need to define and streamline their use as follows

**(i) Grade Point (GP)**

The Grade derives from the actual percentage, raw score for a given course, the raw is converted into letter grade and a grade point.

**(ii) Grade Point Average (GPA)**

Performance in any semester is reported in Grade Point Average. This is the average of weighted grade points earned in the courses during the semester. The Grade Point Average is obtained by multiplying the Grade Point attained in each course by the number of Credit Units assigned to other courses and then summing these up and dividing by the total number of Credit Unit taken for the semester.

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

This is the up-to-date mean of the Grade Points earned by the student in a programme of study. It is an indication of student's overall performance at any point in the training programme. To compute the Cumulative Grade Point Average, the total of grade points multiplied by the respective Credit Units for all the semesters are added and then divided by the total number of Credit Units for all courses registered by the student.

### **2.3 PRACTICAL WORK**

Practical work is the name given to experimental laboratory or workshop assignments to the students at various semesters in the programme. Most of the courses have 'parallel practical components.

### **2.4 CONTINUOUS ASSESSMENT**

Continuous Assessment is a method of periodic assessment of students so as to reduce over-dependence on end-of-course examinations. It normally contributes up to a maximum of 40% of the total course mark for each course distributed as follows: two (2) assignments (10% each); one (1) test (15%) and attendance (5%).

### **3.0 EXAMINATION**

Examinations are conducted at the end of each course in accordance with regulations approved by senate. To be eligible to sit for any end of course examination, students must be duly registered for the course and shall have a minimum of 75% lectures/practical attendance. Every course shall be examined during the academic year for which it is taken. End-of-course examination shall consist of one or more of the following written examination (consisting of biochemical calculations, multiple choice/short answer and essay (60%), although it may be higher in some cases, continuous assessment/practical (maximum 40%); the proportions shall be determined by the department and for biochemistry courses only.

#### **3.1 SEMESTER EXAMINATION**

Considering that the University of Jos has adopted the course credit system, examinations are administered at the end of each course, which is usually at the end of the semester.

### **3.2 SETTING OF QUESTIONS**

All examinations are to have a first examiner (normally the academic staff member in charge of the course) and a second internal examiner (a moderator) as may be approved by the Departmental Board of Examiners. In the case of 400 level examinations, external examiners shall participate in the moderation of question papers and vetting of the answer scripts.

Questions to be set and the number to be answered shall be based on the credit unit of the course as may be approved by the Departmental Board of Examiners (usually consisting of all the academic staff of the department). Examiners shall be expected to submit examinations answer scripts, marking schemes and course marks within fourteen days after the date of the examination.

### **3.3 EXTERNAL EXAMINER**

External examiners are used only in the final year of the undergraduate programme to assess final year courses, performance of the graduating students, as well as the quality of facilities and teaching.

### **3.4 WITHDRAWAL AND PROBATION**

- (a) Probation simply implies a warning lasting for a period of one academic session and extended to a student whose performance falls below the expected specified minimum standard [(d) below].
- (b) The common denomination in assessing a student's overall performance in his programme of study, regardless of the number of credit units taken, is the cumulative grade point average (CGPA)
- (c) To be considered eligible to graduate, a student needs to earn an overall CGPA of at least 1.50.

- (d) A student whose CGPA falls below 1.50 at the end of a session shall be placed on a period of probation for one academic session.
- (e) At the end of a particular period of probation where the student still earns a CGPA of less than 1.50, he shall be required to withdraw from the programme.
- (f) In order to minimize waste of human resources, consideration is normally given to students withdrawn from the programme at 200 level to transfer to other related programmes within the University perceived as relevant for that purpose.

### 3.5 REPEATING FAILED COURSES

Subject to the conditions for withdrawal and probation, a student may be allowed to repeat the courses failed at the next available opportunity provided that the total number of credit units he/she has to carry during the session shall not exceed 48. The Grade points earned at all attempts in such courses shall count towards the CGPA.

### 3.6 SCORING SYSTEM

The following scoring system shall be applied to each examination:

| Mark        | Letter Grade | Grade Point |
|-------------|--------------|-------------|
| 70% & above | A            | 5           |
| 60-69%      | B            | 4           |
| 50-59%      | C            | 3           |
| 45-49%      | D            | 2           |
| 00-44%      | E            | 0           |

From the foregoing the pass mark for each course is 45%. The examination results have to be reported to and approved by the Departmental Board, Faculty Board and Senate.

### **3.7 ELIGIBILITY FOR GRADUATION**

For a student that enters through UME/Rem. The minimum Cumulative Total Credit Earned (CTCE), including all core courses is 125; whereas that for DE students is 95.

### **3.8 DURATION OF COURSES**

For a DE student, the period is 3 years whereas for UME/Rem. student, it is 4 years.

### **3.9 EXAMINATION REGULATIONS AS APPROVED BY SENATE**

1. Students must leave all documents outside the examination halls.
2. No student(s) will be allowed:
  - a. into the examination hall after the first 30 minutes of each examination
  - b. to leave examination hall within the first 30 minutes of each examination.
  - c. to leave the examination hall during the last 15 minutes of each examination.
3. Student(s) Shall:
  - a. use or consult, during an examination, only such books, papers, notes, instruments or other materials or aids as are specifically permitted or provided by the department whose examination is being taken,
  - b. not introduce nor attempt to introduce any book(s) papers, notes, instruments or other materials or aids into the examination room other than those permitted by the department,

- c. not pass or attempt to pass any information from one to another during an examination,
  - d. not act in collusion with any other candidate (s) or person(s),
  - e. not copy, or attempt to copy from another candidate nor engage in any similar activity,
  - f. not disturb or distract any other candidate during the examination
4. Each student should ensure that his/her answer script has been dully handed over to the chief invigilator at the end of the examination before he/she leaves the hall. The responsibility to ensure that this is done is entirely that of the student.
5. Failure to observe any of the above regulations shall, *prima facie*, constitutes misconduct and senate shall accordingly decide the appropriate penalty in cases of any proven misconduct.

### 3:10 EXAMINATION OFFENCES AND PUNISHMENTS

#### 1. Examination Leakages

All cases of leakages once established should be reported to the Police promptly for prosecution. The relevant Department/units of the university affected and those responsible for handling such matters should be directed to act expeditiously.

#### **Punishment**

- i. If found guilty, the student shall be immediately expelled from the university
- ii. If however, the student is not guilty, the results shall be released and the student allowed to start afresh from where the purported offence was committed

## **2. Impersonation:**

This includes among another, the hiring and arranging with examination touts, contractors, etc. Whether students of the University or outsiders, to write examinations for the students who hired or contracted them.

### **Punishment**

- i. The student who hires or contracts somebody to write shall be expelled from the university
- ii. If the impersonator is a student of the university he shall be expelled  
But if the impersonator is not a student of the University of Jos, he/she shall be handed over to the Police for prosecution.

## **3. Bringing Foreign Unauthorised Materials into The Examination Hall**

This includes smuggling of items hidden in different parts of the body such as scripts, text books, note books, pages, textbooks, question papers of previous examination, blank pieces of papers or handkerchiefs, shirts, wait slips, currency notes with notes, photocopies, notes on palms and thighs, etc.

### **Punishment**

The student shall be expelled from the university, and the paper involved shall be cancelled.

## **4. Taking Exam Scripts Out of Exams Hall**

Any candidate who takes out, throws out or fails to submit his exams scripts after the exams, commits a serious misconduct.

## **Punishment**

The student who commits the above misconduct shall be expelled from the university.

### **5. Unauthorised Exchange of Information in the Examination Hall**

This includes collusion, copying “giraffing” and all forms of assistance and similar offences.

#### **Punishment**

- i. Suspension for the next two semesters and cancellation of the result of the paper(s) involved
- ii. If caught a second time in the same offence, the student shall be expelled from the University.

### **6. Punishment for Insult or Assault on Supervisors and Invigilator**

- i. The student(s) involved would be expelled from the University
- ii. The student(s) will be handed over to the Police for prosecution

## **3.11 APPROVED DRESS CODE FOR STUDENTS ON THE CAMPUS**

In view of the deteriorating and debasing dressing styles on campus, the following dressing codes are hereby made for male and female students respectively.

### **MALE STUDENTS**

- a. All male students must be responsible in their dressing and appearances.
- b. Male students may wear traditional outfits of any cultural background provided they are decent.
- c. Foreign wears; such as complete suit or shirt and trousers are also permitted.
- d. All shirts that have buttons must be properly buttoned.



e.No male students should plait or perm his hair or wear earrings or present an unwholesome hair style.

## **FEMALE STUDENTS**

- a.All female students must be decently and responsibly dressed at all times.
- b.Female students may appear in any traditional attires of their choice (wrappers, Booboos, etc) provided they are decent.
- c.Complete foreign wears-such as skirt and blouse, suits and other corporate wears are permitted.
- d.Female students should not wear skirts that stop above the knees (no minis).
- e.Female students should not wear half/blouses (blouses stopping short of the hips and thereby revealing the belly region). Exposing the breast region.
- f.No transparent dresses are allowed.
- g.No body-hug dresses of any kind are allowed on campus.
- h.No female student is allowed to wear any dress that reveals her bursts.
- i. Wears, which have the tendency to show the contours of the body, are not allowed.

For their academic purposes, some students may have to dress otherwise for reasons of rehearsals and productions. Such students would be required to change into proper dresses immediately after such occasions.

## **Violation**

Any violation of this dress code is subject to:-

- a. Being sent out of class by the lecturer
- b. Written warning for repeated violators
- c. Appearance before student disciplinary committee for those who continue to violate despite written warning.

In conclusion, it is believed that concerted efforts by both staff and students will sanitize the way our students dress.

### **ABSENCE FROM LECTURES**

If, for any reason, a student wishes to be away from lectures, he/she must obtain a written permission from the Head of Department. In the case of ill-health (emergency), a medical report should be attached to a letter to the HOD on resumption.

### **IMPORTANT NOTE**

Any student involved in any form of examination misconduct will be dismissed from the University.

All cases of examination leakage will be referred to the Miscellaneous Offenses Tribunal for appropriate action.

### **3.12 GLOSSARY OF TERMS**

|       |  |
|-------|--|
| ME:   | Mode of Entry (either UME,DE or REM)   |
| UME:  | University Matriculations Examination  |
| DE:   | Direct Entry   |
| REM:  | Remedial   |
| MNSA: | Maximum Number of Semester Allowed For those through UME it is 12 semesters; those through direct entry (DE) it is 10 semesters. Ideally UME/REM should spend 6 semesters to graduate. Put another way, candidates should not stay longer than two extra sessions after the successful graduation of their classmates. |
| NSS:  | Number of Semesters spent  |

TCR: Total Credit Units Registered  
TCE: Total Credit Units Earned  
GP: Grade Point  
TGP: Total Grade Point  
GPA: Grade Point Average

**Mathematically:**

$$\text{GPA} = \frac{\text{TGP}}{\text{TCR}}$$

CTCR: Cumulative Total Credit Units Registered  
CTCE: Cumulative Total Credit Earned  
CTGP Cumulative Total Grade Point  
CGPA Cumulative Grade Point Average

**Mathematically:**

$$\text{CGPA} = \frac{\text{CTGP}}{\text{CTCR}}$$

The CGPA determines the class of degree to be awarded. For students that entered through UME/REMS, their CGPA begins at 100 level whereas those that entered through DE, theirs begins at 200 level.

**3.13 CLASS OF DEGREE**

| <b>CGPA RANGE</b> | <b>CLASS</b>       |
|-------------------|--------------------|
| 3.50 – 4.00       | First Class        |
| 2.50 – 3.49       | Second Class Upper |
| 1.40 – 2.49       | Second Class Lower |
| 1.00 – 1.39       | Third Class        |
| 0.00 – 0.99       | Withdrawal         |

Since the CGPA is cumulative, students will do well not to relax at any point (Level) in their academic sojourn in the University.

## SAMPLE CALCULALTION FOR GPA/CGPA

### At 100 level (No CGPA)

$$\begin{aligned} \text{Let TCR} &= 50 \\ \text{Let TGP} &= 120 \\ \text{GPA} &= \frac{120}{50} \\ &= 2.40 \end{aligned}$$

### At 200 Level

Let TCR = 30, Let TGP = 55

$$\text{GPA} = \frac{\text{TGP}}{\text{TCR}} = \frac{55}{30} = 1.83$$

CGPA at 200 Level

$$\begin{aligned} \text{CTCR} &= \text{TCR}_{100L} + \text{TCR}_{200L} \\ &= 50 + 30 = 80 \\ \text{CTGP} &= \text{TGP}_{100L} + \text{TGP}_{200L} \\ &= 120 + 55 = 175 \\ \text{CGPA} &= \frac{\text{CTGP}}{\text{CTCR}} = \frac{175}{80} = 2.18 \end{aligned}$$

## DIFFICULT SITUATIONS

Where a student has any problem(s) he/she is expected to report to the Head of Department who will decide what to be done next.

A session is made up of the first semester and the second semester. Examination will hold at the end of each semester. Since the semester system encompasses the totality of the student's performance in all examinations, assessment, practical for all the levels, a serious attitude should therefore be the pre-occupation of all students if they are to graduate with good results.

### 3.14 COURSE STRUCTURE

#### 100 LEVEL FIRST SEMESTER COURSES

| <b>COURSE<br/>CODE</b> | <b>CODE<br/>NUMBER</b> | <b>COURSE TITLE</b>              | <b>CREDIT UNIT</b> | <b>SEMESTER</b> |
|------------------------|------------------------|----------------------------------|--------------------|-----------------|
| BIO                    | 101                    | General Biology I                | 4                  | 1               |
| BIO                    | 105                    | Practical Biology                | 1                  | 1               |
| CHM                    | 101                    | General Chemistry I (Physical)   | 3                  | 1               |
| CHM                    | 103                    | Practical Physical Chemistry     | 1                  | 1               |
| PHY                    | 101                    | General Physics I                | 3                  | 1               |
| PHY                    | 107                    | General Physics Laboratory I     | 1                  | 1               |
| MTH                    | 101                    | Elementary Mathematics I         | 3                  | 1               |
| CS                     | 101                    | Introduction to Computer Science | 2                  | 1               |
| LIB                    | 101                    | Library Skills                   | 1                  | 1               |
|                        |                        |                                  | 19 CR              |                 |

## 100 LEVEL SECOND SEMESTER COURSES

| <b>COURSE<br/>CODE</b> | <b>CODE<br/>NUMBER</b> | <b>COURSE TITLE</b>                    | <b>CREDIT UNIT</b> | <b>SEMESTER</b> |
|------------------------|------------------------|--|--------------------|-----------------|
| BIO                    | 102                    | General Biology II                     | 4                  | 2               |
| CHM                    | 102                    | General Chemistry II (Organic)         | 3                  | 2               |
| CHM                    | 104                    | Practical Organic Chemistry            | 1                  | 2               |
| CHM                    | 105                    | General Chemistry III (Inorganic)      | 3                  | 2               |
| CHM                    | 106                    | Practical Inorganic Chemistry          | 1                  | 2               |
| PHY                    | 102                    | General Physics II                     | 2                  | 2               |
| PHY                    | 108                    | General Physics Laboratory II          | 1                  | 2               |
| MTH                    | 102                    | Elementary Mathematics II              | 3                  | 2               |
| MCB                    | 101                    | Introductory Microbiology              | 2                  | 2               |
| GST                    | 101                    | Use of English                         | 2                  | 2               |
| GST                    | 102                    | Philosophy and Logic                   | 2                  | 2               |
| GST                    | 103                    | History of Nigerian People and Culture | 2                  | 2               |
| GST                    | 104                    | History and Philosophy of Science      | 2                  | 2               |
|                        |                        |  | 28CR               |                 |

## 200 LEVEL FIRST SEMESTER COURSES

| <b>COURSE CODE</b> | <b>CODE NUMBER</b> | <b>COURSE TITLE</b>                             | <b>CREDIT UNIT</b> | <b>SEM</b> | <b>PREREQ UISITE</b> |
|--------------------|--------------------|---|--------------------|------------|----------------------|
| BCH                | 202                | Structure and function of Major Cell components | 1                  | 1          | CHM102               |
| BCH                | 203                | Chemistry of Amino Acids and Proteins           | 2                  | 1          | CHM102               |
| BCH                | 207                | Chemistry of Carbohydrates                      | 1                  | 1          | CHM102               |
| BCH                | 205                | General Biochemistry Laboratory I               | 1                  | 1          | CHM 102              |
| BIO                | 201                | Genetics I                                      | 2                  | 1          |                      |
| BIO                | 204                | Biological Techniques                           | 2                  | 1          |                      |
| CHM                | 210                | Physical Chemistry II                           | 2                  | 1          | CHM101               |
| CHM                | 211                | Organic Chemistry II                            | 3                  | 1          | CHM 102              |
| CHM                | 212                | Inorganic Chemistry II                          | 2                  | 1          | CHM 105              |
| CS                 | 201                | Application of Computer in Science              | 3                  | 1          | CS 101               |
| EPS                | 201                | Entrepreneurial Skills I                        | 2                  | 1          |                      |
| GST                | 201                | Communication Skills                            | 3                  | 1          |                      |
|                    |                    |   | 24Cr               |            |                      |
| <b>Electives</b>   |                    |   |                    |            |                      |
| PST                | 202/203            | Seed/seedless Plants                            | 2                  | 1          |                      |
| CHM                | 214                | Structure and Bonding                           | 2                  | 1          |                      |

## 200 LEVEL SECOND SEMESTER COURSES

| <b>COURSE CODE</b> | <b>CODE NUMBER</b> | <b>COURSE TITLE</b>                | <b>CREDIT UNIT</b> | <b>SEMESTER</b> | <b>PREREQUISITE</b> |
|--------------------|--------------------|------------------------------------|--------------------|-----------------|---------------------|
| BCH                | 204                | Chemistry of Lipids                | 1                  | 2               | CHM102              |
| BCH                | 210                | Chemistry of Nucleic Acids         | 1                  | 2               | CHM102              |
| BCH                | 206                | General Biochemistry Laboratory II | 1                  | 2               | CHM 102             |
| BIO                | 203                | General Physiology                 | 2                  | 2               |                     |
| BIO/STA            | 202                | Statistics for Biologists          | 4                  | 2               |                     |
| CHM                | 213                | Analytical Chemistry II            | 3                  | 2               |                     |
| MCB                | 201                | General Microbiology I             | 3                  | 2               | MCB 101             |
| GST                | 207                | Communication Skills I             | 2                  | 2               |                     |
| 17Cr               |                    |                                    |                    |                 |                     |
| <b>Electives</b>   |                    |                                    |                    |                 |                     |
| BIO                | 205                | Intro. Developmental Cell Biology  | 3                  | 2               |                     |
| PST                | 202/203            | Seed/seedless Plants               | 2                  | 2               |                     |



### 300 LEVEL FIRST SEMESTER COURSES

| COURSE CODE | CODE NUMBER | COURSE TITLE                           | CREDIT UNIT | SEMESTER | PREREQUISITE |
|-------------|-------------|--|-------------|----------|--------------|
| BCH         | 301         | Enzymology                             | 3           | 1        | BCH 203      |
| BCH         | 302         | Metabolism of Carbohydrates            | 2           | 1        | BCH 207      |
| BCH         | 303         | Metabolism of Lipid                    | 2           | 1        | BCH 204      |
| BCH         | 304         | Metabolism of Amino Acids & Proteins   | 2           | 1        | BCH 203      |
| BCH         | 305         | Metabolism of Nucleic Acids            | 2           | 1        | BCH 210      |
| BCH         | 306         | Methods in Biochemistry                | 3           | 1        |              |
| BCH         | 307         | Membrane Biochemistry                  | 2           | 1        |              |
| BCH         | 310         | Bioenergetics                          | 1           | 1        |              |
| BCH         | 311         | General Biochemistry Laboratory III    | 1           | 1        | BCH 205, 206 |
| CHM         | 301         | Physical Chemistry III                 | 2           | 1        | CHM 210      |
| CHM         | 303         | Organic Chemistry III                  | 3           | 1        | CHM 211      |
| CHM         | 312         | Instrumental Methods of Analysis       | 2           | 1        | CHM 211      |
| MCB         | 301         | Microbial Genetics & Molecular Biology | 3           | 1        | MCB 201      |
| MCB         | 302         | Microbial Physiology and Metabolism    | 3           | 1        | MCB 201      |
| EPS         | 310         | Entrepreneurial Skills II              | 2           | 1        | EPS 201      |
|             |             |  | 33Cr        |          |              |

### 300 LEVEL SECOND SEMESTER COURSES

| COURSE CODE | CODE NUMBER | COURSE TITLE                       | CREDIT UNIT | SEMESTER | PREREQUISITE |
|-------------|-------------|------------------------------------|-------------|----------|--------------|
| BCH         | 399         | Student Industrial Work Experience | 6           | 2        |              |
|             |             |                                    | 6Cr         |          |              |

## 400 LEVEL FIRST SEMESTER COURSES

| COURSE CODE | CODE NUMBER | COURSE TITLE                                  | CREDIT UNIT | SEM | PREREQUISITE |
|-------------|-------------|---|-------------|-----|--------------|
| BCH         | 401         | Advanced Enzymology                           | 2           | 1   | BCH 301      |
| BCH         | 402         | Biosynthesis of Macromolecules                | 1           | 1   |              |
| BCH         | 404         | Bioinorganic Chemistry                        | 1           | 1   |              |
|             |             |   |             |     |              |
| BCH         | 408         | Biochemical Reasoning                         | 1           | 1   |              |
| BCH         | 409         | Special Topics/Seminar in Biochemistry        | 2           | 1   |              |
| BCH         | 410         | Advanced Biochemical Methods                  | 2           | 1   | BCH 306      |
| BCH         | 411         | Research Project                              | 6           | 1   | BCH 306      |
| BCH         | 413         | Toxicological and Pharmaceutical Biochemistry | 2           | 1   |              |
| BCH         | 415         | Advanced Molecular Biology                    | 2           | 1   | MCB 301      |
| 22CR        |             |   |             |     |              |
| Electives   |             |   |             |     |              |
| BCH         | 426         | Blood Biochemistry                            | 2           | 1   |              |
| BCH         | 429         | Comparative Biochemistry                      | 2           | 1   |              |

## 400 LEVEL SECOND SEMESTER COURSES

| <b>COURSE CODE</b> | <b>CODE NUMBER</b> | <b>COURSE TITLE</b>                 | <b>CREDIT UNIT</b> | <b>SEM</b> | <b>PREREQUISITE</b> |
|--------------------|--------------------|-------------------------------------|--------------------|------------|---------------------|
| BCH                | 403                | Tissue Biochemistry                 | 1                  | 2          |                     |
| BCH                | 405                | Biotechnology & Genetic Engineering | 3                  | 2          | MCB 301             |
| BCH                | 406                | Metabolic Regulations               | 3                  | 2          | BCH 302             |
| BCH                | 407                | Plant Biochemistry                  | 2                  | 2          |                     |
| BCH                | 412                | Industrial Biochemistry             | 3                  | 2          |                     |
| BCH                | 414                | Food and Nutritional Biochemistry   | 2                  | 2          |                     |
| 16CR               |                    |                                     |                    |            |                     |
| Electives          |                    |                                     |                    |            |                     |
| BCH                | 420                | Forensic Biochemistry               | 2                  | 2          |                     |
| BCH                | 425                | Enzyme Biotechnology                | 1                  | 2          |                     |
| BCH                | 427                | Parasite Biochemistry               | 2                  | 2          |                     |

## 3.15 COURSE DESCRIPTION

### 100 LEVEL

**BIO 101: General Biology** (4 credits)

Cell structure and organization; functions of cellular organelles; diversity: Characteristics and classification of living things; general reproduction; interrelation of organism; heredity and evolution: elements of ecology and types of habitat.

**BIO 102: General Biology II** (4 credits)

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

**BIO 105: Practical Biology** (3 credits)

Principles of microscopy, introduction to biological drawing techniques. Introduction to classification and varieties of animals. Visit to zoos and wildlife parks. Study of external features of animals. Culture media in zoological studies, culturing of animals, animal tissues and cells, fish quantitative ecology. Methods of measuring environmental factors, biotic analysis. Dissection of representatives of different groups of invertebrate, proto chorda to expose their respiratory circulatory, osmoregulatory, neural endocrine and reproductive systems.

**CHM 101: Introductory Physical Chemistry I** (3 credits)

Atoms, molecules; chemical reaction, chemical equations and stoichiometry; Atomic structure and periodicity; modern electronic theory of atoms; Radio activity; chemical bonding; properties of gases; Equilibria and thermodynamics; chemical kinetics; Electrochemistry, Thermo chemistry.

**CHM 102: Introductory Organic Chemistry I** (3 credits)

Historical survey of the development and importance of organic chemistry; Nomenclature and classes of organic compounds; homologous series; The carbon atom and bonding, structural and optical isomers, functional groups; conformation, alkanes, alcohols; amine,

aldehydes, ketones; carboxylic acids; amino acids, benzene compounds and phenols. Determination of structure of organic compounds; electronic theory in organic chemistry; preparation, isolation and purification of organic compounds, quantitative and qualitative analysis of organic compounds. Petrochemicals in industrial raw material. Prospects for the petrochemical industry in Nigeria.

**CHM 103: Practical General Chemistry I (1 credit)**

General Laboratory Safety, Quantitative Measurements: The Chemical Combination: Synthesis of a Sulphide of Copper by elementary fusion. Synthesis of a Sulphide of Copper by ion combination. Determination of the equivalent weight of a metal. Titrimetric Analysis: Determination of Sodium Hydroxide. Titrimetric Analysis. Determination of Sulphuric Acid using standard Sodium Hydroxide. Determination of Sulphuric Acid using Primary Standard Sodium Trioxocarbonate (iv). Gravimetric Analysis: Determination of Barium. Acid-Base indicators.

**CHM 104: Practical Organic Chemistry I (1 credit)**

Recrystallisation of organic compound. Determination of melting point. Simple and Fractional Distillation. The Preparation and Reactions of an Alkene. The Preparation of Propanol and formation of a Hydrazones. Identification Test for Aldehydes and Ketones. Reactions of Amines:- Preparation of N-phenylethanamide. Phenyls and Ester:- Preparation of Aspirin. Identification of Organic functional Groups. Thin Layer Chromatography.

**CHM 105: Inorganic Chemistry I (3 credits)**

Periodic table and periodicity of elements; Chemistry of hydrogen. Study of groups I and II metals; oxides and hydroxides, halides and aqueous Chemistry. Valency forces, structure of solids. Characteristics of the first row transition metals ; oxidation states, redox reactions and complexes. Chemistry of iron and study of the group VII processes.

**MTH 101: Elementary Mathematics 1 (3 credits)**

Elementary Set Theory, subsets, union interaction; complements, venn diagrams, Real numbers; integers, rational and irrational numbers, mathematical induction, real

sequences and series, theory of quadratic equations, binomials theorem, Complex numbers; Algebra of complex numbers, the Argand Diagram, De Moivre's theorem,  $n$ th roots of unity. Circular measure, trigonometric function of angles and magnitude, addition and factor formulae, indices and logarithms; matrices and determinants, partial fractions.

**CS 101: Introductory Computer Science (2 credits)**

History of Computers, Functional components of computers, Characteristics of a computer, problem solving, flow charts Algorithms, Computer programming statements symbolic names; Arrays; subscripts, expressions and control statements, introduction to basic or Fortran Programming Language, Computer Applications.

**CS 102: Introduction to Computer Application (2 credit)**

Operational parts of micro Computer Operating Systems. MS DOS, Windows 95, 98 or 2000 Word Processing (Microsoft Word or Word Perfect) Spreadsheets (MS Power Point) Database Management System.

**GST 101: Use of English (4 credits)**

Effective communication and writing in English. Study skills. Writing of essay answers. Instruction on Lexis sentence construction, outlines and paragraphs. Collection and organization of materials and logical presentation. Punctuation and logical presentation of papers. Use of the library. Phonetics. Art of public speaking and oral communication.

**GST 103: Nigerian People and Culture (2 credits)**

Study of Nigerian History and Culture in pre-colonial times. Nigerian's Perception of his world. Culture areas of Nigeria and their characteristics. Evolution of Nigeria as a political unit. Concepts of functional education; National economy; balance of trade, economic self reliance, social justice, individual and national development. Norms and values, Moral obligations of citizens. Environmental sanitation.

**GST 104: History and Philosophy of Science (2 credits)**

Man – his origin and nature; Man and his cosmic environment; scientific methodology; Science and Technology in the society and service of man. Renewable and non-renewable resources – man and his energy resources. Environmental effects of chemicals, plastics, textiles, wastes and other materials. Chemical and Radiochemical hazards. Introduction to the various areas of sciences and technology.

**GST 102: Philosophy and Logic (2 credits)**

A brief survey of main branches of Philosophy, Symbolic logic: special symbols in symbolic logic – conjunction, negation, affirmation, disjunction, equivalence and conditional statements, laws of thought. The method of deduction using rules of inference and biconditionals. Qualifications theory.

**GST 222: Peace and Conflict Resolution (2 credits)**

Basic concepts in peace studies and conflict resolution peace as a vehicle of unity and development, conflict issues, types of conflict e.g ethnic/religious/political/economic conflicts. Root causes conflicts and violence in Africa, indigene and settler phenomenon, peace-building, management of conflict and security. Elements of peace studies and conflict resolution. Developing a culture of peace, peace mediation and peace keeping. Alternative Dispute Resolution (ADR). Dialogue/arbitration in conflict resolution. Role of international and regional organizations (ECOWAS, African Union, United Nations) in conflict resolution.

**GST 223: Introduction to Entrepreneurship (2 credits)**

Course objective: the course aims to inspire an entrepreneurial attitude/spirit in all students so that each student can identify opportunities for business in the courses they are offering or their environment which they can finance or ask others to finance and thus contribute to national development, Introduction to entrepreneurship and new venture creation; Entrepreneurship in theory and practice; the opportunity, forms of business, staffing, marketing and new venture. Determining capital requirements, raising capital, financial planning and management; starting a new business. Others include feasibility

studies, innovation, legal issues, insurance and environmental conditions, possible business opportunities in Nigeria.

## **200 LEVEL**

### **BCH 202 Structure and Functions of Major Cell Components: (1 Credit Unit)**

The cell as the reaction vessel; Prokaryotic and Eukaryotic cells. Elementary treatment of membrane structures (the fluid mosaic model) and function in eukaryotic cells. Transport across membranes and the regulation of intracellular environment. Cell organelles: brief treatment of structure and function; preparation of subcellular fractions; simple biochemical and biophysical techniques for isolation and characterization of the major cell components.

### **BCH 203 Chemistry of Amino Acids and Proteins: (2 Credit Units)**

Chemistry of amino acids: structure, properties and classification of amino acids. Peptides. Reaction of specific amino acids, separation and sequence analysis of peptides. Chemistry of proteins: Primary, Secondary, tertiary and quaternary structures of proteins; determination and biochemical applications of the structures; proteins and their derivatives; methods of isolation and identification; Acidity and alkalinity, pH and pKa values and their effects on cellular activities; Buffers.

### **BCH 204 Chemistry of Lipids (1 Credit Unit)**

Chemistry, classification and properties of lipids; methods of analysis; lipoproteins, membranes and membrane structure.

### **BCH 205 General Biochemistry Laboratory I: (1 Credit Unit)**

Introduction to the laboratory and laboratory equipment. Safety, housekeeping, washing and drying of glassware in the laboratory. Accuracy of measurement and transfer of liquids and solids. Introduction to photometry and colorimetry; standard curve and absorption spectra; pH and buffer systems. Qualitative and quantitative tests for amino acids and proteins. Biuret method and the estimation of proteins.



**BCH 206: General Biochemistry Laboratory II (1 Credit Unit)**

Reactions of carbohydrates; thin layer chromatographic separation of sugars. Estimation of glucose in biological fluids (blood and urine). Analysis of lipids for double bonds and free fatty acids; separation by thin layer chromatography. Separation and purification of nucleic acids; estimation of DNA and RNA and estimation of phosphates and titratable acidity.

**BCH 207 Chemistry of Carbohydrates (1 Credit Unit)**

Classification and physical properties of carbohydrates; structure of glucose, structure and properties of other monosaccharides, oligosaccharides and polysaccharides.

**BCH 210 Chemistry of Nucleic Acids: (1 Credit Unit)**

Chemistry, classification and properties of nucleic acids. Nomenclature of nucleosides and nucleotides; effects of acid and alkali on hydrolysis of nucleic acids. Structures and roles of RNA and DNA

**300 LEVEL**

**BCH 301 Enzymology: (3 Credit Units)**

Enzymes as biological catalysts, Properties including coenzymes and cofactor. Vitamins as coenzymes. Vitamins and co-enzymes. Fat and water soluble vitamins. Structures and functions of vitamins and co-enzymes. Classification and nomenclature of enzymes. Kinetics of enzymes and inhibition. Mechanisms of enzyme-catalyzed reactions. Effects of temperature, pH, ions and inhibitors on enzyme catalyzed reactions. Michaelis-Menten Equation. Allosteric/Regulatory enzymes. Active sites of enzymes. Estimation of kinetic parameters -enzyme activities,  $K_m$ ,  $V_{max}$ ,  $K_i$ , etc. Zymogen activation, digestive enzymes etc. Production, isolation, purification and characterization of enzymes. Recent advances in enzymology.

**BCH 302 Metabolism of Carbohydrates; (2 Credit Units)**

Degradation and digestion of carbohydrates - sugars, storage polysaccharides and cell walls. Reactions of sugars. Glycolysis, the Tricarboxylic acid cycle, the phosphogluconate pathway the glyoxylate pathway; the pentose phosphate pathway and the cori cycle: the calvin pathway. Gluconeogenesis, glycogenesis and glycogenolysis. Disorders of carbohydrate metabolism.

**BCH 303 Metabolism of Lipids: (2 Credit Units)**

Classification of lipids - fatty acids, triglycerides, glycosylglycerols, phospholipids, waxes, prostaglandins. Lipid micelles, monolayers, bilayers, Lipoprotein systems. Oxidation and synthesis of fatty acids; cholesterol synthesis. Formation of ketone bodies. Integration of lipid metabolism. Active acetic acid as a central precursor for biosynthesis of lipids.

**BCH 304 METABOLISM OF AMINO ACIDS AND PROTEINS: (2 Credit Units)**

Amino acids as building blocks of proteins; covalent backbone of proteins; Amino acid sequence of proteins. Protein isolation, fractionation, purification and characterization of proteins. Biological functions of proteins. Oxidative degradation of amino acids and metabolism of one carbon units. Biosynthesis of amino acids and some derivatives; the urea cycle; metabolism of inorganic nitrogen. Disorders of amino acid metabolism.

**BCH 305 Metabolism of Nucleic Acids: (2 Credit Units)**

Genome organization and biosynthesis of proteins. Metabolism of purines and pyrimidines, nucleosides and nucleotides; abnormalities in nucleic acid metabolism-*xeroderma pigmentosum* and skin cancer. Principles of polymer building in nucleic acids. Structure and properties of DNA and RNA molecules. Biosynthesis of purine and pyrimidine nucleotides; the salvage pathways.

**306 Methods in Biochemistry: (3 Credit Units)**

Principles of instrumentation in biochemistry, with emphasis on isolation and characterization of major sub cellular units, enzymes, proteins, etc and monitoring of metabolic pathways. Principles, methodologies and applications of electrophoresis, chromatography, thin layer chromatography, spectroscopy, spectroscopy and spectrophotometry, centrifugation, and isotopic techniques. Protein determination by micro-Kjeldale method; fractionation and plasma protein.

**BCH 307 Membrane Biochemistry: (2 Credit Unit)**

Structure, composition and functions of biological membranes. Isolation, characterization and classification of membrane; chemistry and biosynthesis of membranes. Molecular organization of membrane components. Natural and artificial membrane bilayers – the unit membrane hypothesis. Transmembrane transport system: characteristics of mediated/facilitated transport (active versus passive transport systems).

Transport of ions, sugars and amino acids across membranes. Thermodynamics of transmembrane transport. Transmembrane transport-mediated energy transductions other than photosynthesis; mechanical to chemical energy; mechanical to electrical energy/light energy, etc. Current knowledge of membrane pores(ionophores). Intercellular communication through cell membrane.

**BCH 310 Bioenergetics: (1 Credit Unit)**

High-energy compounds; Chemical potentials, electrochemical potentials, electron transport system and oxidative phosphorylation; Regulation of ATP. Chemical thermodynamics; Oxidations and reductions. Redox potentials; the Nernst equation. Enzyme catalysis and thermodynamic functions.

**BCH 311 General Biochemical Methods (Practical): (1 Credit Unit)**

Practical laboratory in areas of interest of academic staff to cut across a wide spectrum of general biochemistry. Principles and procedures in chromatographic techniques, photochemical analysis, extraction of enzymes and enzyme kinetics, isolation of cellular fractions, nutrition value analysis, phytochemical analysis. Laboratory practicals may be arranged on the basis of 6 hours or 3 hours per week for a second semester.

**BCH 399 Student Industrial Work Experience (SIWES): (6 Credit Units)**

The Students Industrial Experience Scheme (SIWES) is accepted skills training programme, which forms part of the approved minimum academic standards. It is an effort to bridge the gap existing between theory and practice. It is aimed at exposing students to machines and equipment, professional work methods and ways of safeguarding the work areas and workers in industries and other organizations.

The minimum duration for SIWES is six months and carries 6 credit units. Students are required to obtain and study copies of job specifications and training log book, as well as attend and participate in a compulsory orientation programme before the commencement of the exercise at the end of the first semester of the 300 level. Lecturers from the Department are assigned to supervise students at least three times before the end of the exercise. On return from the SIWES, students are required to return with their duly supervised and signed logbooks and forms. They are also required to write a comprehensive technical report which will be assessed along with the logbook during an oral presentation to the Departmental Academic Board.

All rules and regulations guiding the programme must be adhered to. Failure to comply may attract strict penalties including disqualification from the exercise.

## **400 LEVEL**

### **BCH 401: Advanced Enzymology: (2 Credit Units)**

Steady state enzyme kinetics. Transient kinetic methods. Chemistry of enzyme catalysis. Special features of regulatory enzymes and their modulators. Molecular models for allosterism. Multienzyme complexes. Enzyme assays. Criteria for determining purity of enzymes. Enzyme reconstitution. Regulation of enzyme activity and synthesis. Tissue distribution of enzymes and value in medicine and biochemical industry. (Pre-Requisite BCH 301).

### **BCH 402 Biochemistry of Macromolecules: (1 Credit Unit)**

Structure and functions of macromolecules. Storage and structural polysaccharides; mucopolysaccharides; glycoproteins; bacterial cell wall; Synthesis of complex lipids, lipoproteins and nucleic acids.

### **BCH 403 Tissue Biochemistry: (1 Credit Unit)**

Biochemistry of muscles, kidney, liver, and adipose tissues. General metabolism of the brain and neuronal biochemistry. Biochemistry of reproductive tissues. Detoxification and excretion in tissues.

### **BCH 404 Bioinorganic Chemistry: (1 Credit Unit)**

Relationship between the physicochemical properties and biological functions of inorganic ions. Ligand complexes and their biochemical significance. Electrolyte metabolism. Nitrogen fixation and sulphur cycle.

### **BCH 405 Biotechnology and Genetic Engineering: (3 Credit Units)**

Replication, transcription and translation – a brief review. The genetic code and its relationship to cellular functions. DNA replication in a cell-free system. Genetic transformation, transduction and conjugation. Gene mutation, mutagenic agents and their applications to gene-transfer. DNA repair mechanism. Gene mapping. Structure of eukaryotic genome. Recombinant DNA and its application. Hybridomas. Genetically modified food, plants and animals; Social implications of genetic engineering.

**BCH 406 Metabolic Regulations: (2 Credit Units)**

The relationship of Krebs' Cycle to protein, carbohydrate, lipid and nucleic acids metabolism. Integration of metabolic pathways: role of hormones and nervous system. Turn-over rates and metabolic pools. Regulation of enzymes of metabolic pathways ; feedback inhibition versus enzyme synthesis. Catabolite repression, end product repression, the lactose operon and arabinose operon. Identification of different regulatory mechanisms in metabolic pathways.

**BCH 407 Plant Biochemistry: (2 Credit Units)**

Organization of plant cells. Plants versus animals: cellular structures and metabolic processes unique to plants- the cell wall, chloroplasts, glyoxysomes etc; secondary metabolism, photosynthesis, the glyoxylate cycle; chemical substance unique to plants (Phytochemicals) e.g. cellulose, lignin. Characteristic features of plant secondary metabolism; - cell wall substances, alkaloids, phenolics (e.g. flavonoids), plants hormones, Photosynthesis. Biosynthesis of carotenoid pigments, biochemistry of plant development. The plant cell wall structure, formation and growth. Lignin formation. Free amino acids, pyrimidines, purines and nucleosides in plants. Metabolism of auxins, gibberellins and cytokinins. Synthetic growth regulators and herbicides. Structure-function relationship of plant hormones. Industrial, medicinal, cosmetic, food additives etc uses of plant secondary metabolites.

**BCH 408 Biochemical Reasoning: (1 Credit Unit)**

Evaluation and design of experimental biochemistry from available information and data. Analysis, interpretation and inference - drawing from biochemical research data.

**BCH 409 Special Topics/Seminar in Biochemistry: (2 Credit Units)**

Hormones, immunochemistry, oncology, brain biochemistry, monoclonal antibodies, Tropical Diseases and Neglected Tropical Diseases, Apoptosis and signal transduction, Aging process. These may be taught or seminar topics may be assigned to students by academic staff for presentation in a forum of staff and students. The approved written work shall bound and submitted for final scoring. The sections of the bound copy should be organized into four chapters

**BCH 410 Advanced Biochemical Methods (Practical): (2 Credit Units)**

The purpose of this course is to familiarise students with operations of latest biochemical equipment and with methods of research, assimilation and dissemination of information.

Students will go, therefore, round lecturers and laboratories housing specialized equipment with the aim of exposing them to such equipment under the supervision of lecturer. Part of the course will also cover the effective use of the library, preparation of dissertations or theses, papers for journal publications and journal reviews. Special assignments and essays will be given to students.

**BCH 411 Research Projects: (6 Credit Units)**

Independent research into selected areas/topics of interest to the academic staff. Students will be required to carry out literature survey on the topics, perform experiments and produce reports which should be organized into four chapters (Introduction, Literature Review, Materials and Methods, Results and Discussion) providing for the Preliminary section and References. Students will be subjected to both seminar and oral examination on the projects undertaken.

**BCH 412 Industrial Biochemistry: (3 Credit Units)**

A short review of microbial physiology and genetics. A review of general metabolic pathways and application in industrial processes. Continuous culture methods, principles and applications. The chemostat and its application in industrial fermentations. Fermentations - alcoholic, amino acid antibiotics and other secondary metabolites. Primary and secondary metabolism. Process evaluation and development. Over production of metabolites - amino acids, taste enhancers, vitamins, toxin etc. Methods for screening and selecting micro-organisms of industrial importance. Induction of mutation in micro-organism and plants for the purpose of over production; Strain selection/development and enhancement. Gene dosage and its application in industrial processes.

**BCH 413 Toxicological And Pharmacological Biochemistry: (2 Credit Units)**

Cellular metabolism in infected cells. Biochemical aspects of host-parasite relationships. Sources of human exposure to foreign chemical (xenobiotics). Fate of foreign chemicals (including drugs and food toxicants) in the body. Detoxification mechanisms; factors affecting detoxification process and consequences – pharmacological (drugs) and toxicological (non-drug). Metabolic factors affecting chemotherapeutic agents. Theories of the mechanism of drug action. Drug resistances and other factors affecting drug efficacy. The physiological and biochemical action of some selected drugs. Nigerian traditional medicinal plants in the management and therapy of common ailments in Nigeria - malaria, sickle cell anaemia, common cold, hepatitis etc.



**BCH 414 Food And Nutrition Biochemistry: (2 Credit Units)**

An introduction to the theory and application of physical and chemical methods for determining food constituents. Food processing, preservation and storage. Preservation of traditional foods, tubers, fruits and dried seed/grains and green vegetables. Food poisoning and intoxicants, herbicides and pesticides. Chemical and biochemical reactions in foods. Biochemistry aspects of nutrition; classes of foods and their nutritive values, mammalian energy expenditure, nutritional disorders – coronary heart disease, food intolerance, obesity, diabetes, their prevention and therapy. Assessment of nutritional status. Protein energy malnutrition. Recommended dietary allowances. Nutritional requirements in relation to physical activity, ageing, dieting, etc. recent trends in nutrition.

**BCH 415 Advanced Molecular Biochemistry: (2 Credit Units)**

DNA as genetic material Experimental and historical evidence for genes; role of electrophoresis. Biochemical basis of genetic inheritance. Biochemical aspect of cell division, cell cloning and cell fusion. Biochemistry of growth and differentiation in eukaryotes. The eukaryotic, bacterial and viral chromosomes; ultrastructural organization of eukaryotic chromosomes. Gene function: the central dogma. Regulation of gene expression in prokaryotic and eukaryotic cells; viral infection and regulation. Gene transmission: modes and evidence in support of the preferred mechanism of DNA replication. Gene expression vectors and promoters; plasmids and other transposable genetic elements. Gene transfer between bacteria and their viruses: transformation, transduction and conjugation. Gene mapping. DNA sequencing. Restriction endonuclease analysis. Hybridization techniques. Recombinant DNA technology and proteomics. Gene and DNA markers: short tandem repeats (STRs) or microsatellites, restriction fragment length polymorphism (RFLP), expressed sequence tags (EST) and single nucleotide polymorphism (SNP). DNA analysis in agriculture, forensic sciences, medicine, archeology.

**BCH 420: Forensic Biochemistry (2 Credit Units)**

Application of analytical chemistry scientific evidence for the purposes of law. Nigerian laws governing forensic practice; scope of investigation, investigative procedure: collection and preservation of samples (exhibits); extraction identification of useful chemical substance from exhibit (including human tissues); DNA; presentation of findings. The public analyst in forensic medicine, the experts in the witness box.



**BCH 425: Enzyme Biotechnology (1 Credit Unit)**

Principles of industrially large scale production of enzymes (techniques in fermentation). Large scale extraction and purification. Principles and designs of immobilized enzymes. Characteristics of free versus immobilized enzymes. Immobilized enzymes and white cells. Enzyme utilization in industrial processes

**BCH 426: Blood Biochemistry (2 Credit Units)**

Components of haemoglobin: properties of porphyrins; biosynthesis of Haem: haemoprotein interaction and formation of tetramers: oxygenation of haemoglobin, erythrocyte structure and functions, the Bohr effect, chloride shift; plasma proteins; plasma albumin  $\alpha_1$ - and  $\alpha_2$ - globulins, glycoproteins, High density lipoproteins, ceruloplasmin, gamma-globulins, transferrin, low density lipoprotein, plasma enzymes. Analytical methods of plasma protein. Intrinsic and extrinsic mechanisms of blood clotting. immunoglobins.

**BCH 427: Parasite Biochemistry (2 Credit Units)**

Infectious pathogens of humans and animals and their impact on the global environment. Protozoa: plasmodium, trypanosoma, leishmania;. Helminths: schistosoma, onchocerca, filarial parasites. Life cycles. Synthesis and utilisation of carbohydrates, proteins, lipids, and nucleic acids. Parasite glycobiology: GPI anchors, protein glycosylation; glycans and virulence. Host resistance/susceptibility, Host parasite interaction and antigenic variation. Chemotherapy and mechanisms of drug action. Drug resistance and development of drugs. Progress in the development of vaccines. DNA probes and specific markers for parasite identification.

**BCH 429: Comparative Biochemistry (2 Credit Units)**

Comparative study of the major metabolic pathways and processes (including drug metabolism) in organisms at different levels of evolution with special emphasis on their adaptation to the habitats and environmental conditions prevailing in the various life forms. Man's exploitation of such differences in industry, agriculture and medicine (e.g. brewing industry is based on the modification of anaerobic glycolytic pathway in yeast.

## STAFF LIST

### ACADEMIC STAFF

| S/N | NAME            | RANK           |
|-----|-----------------|----------------|
| 1   | G.I. Adoga      | Professor      |
| 2   | M.D. Solomon    | Professor      |
| 3   | I.Y. Longdet    | Professor      |
| 4   | C.D. Luka       | Reader         |
| 5   | T.O. Johnson    | Reader         |
| 6   | J.D. Dabak      | Reader         |
| 7   | K.H. Jaryum     | Reader         |
| 8   | S.Y. Gazuwa     | Reader         |
| 9   | R.J. Kutshik    | Lecturer I     |
| 10  | S.G. Mafulul    | Lecturer I     |
| 11  | G.N. Lepzem     | Lecturer I     |
| 12  | S.H. Sambo      | Lecturer I     |
| 13  | S.A. Olumo      | Lecturer II    |
| 14  | M.M. Mankilik   | Lecturer II    |
| 15  | J.L. Lenka      | Lecturer II    |
| 16  | E.B. Joel       | Lecturer II    |
| 17  | C.E. Mafuyai    | Asst. Lecturer |
| 18  | J.I. Oche       | Asst. Lecturer |
| 19  | A. O. Olumuyiwa | Asst. Lecturer |
| 20  | M.K. Jiyil      | Asst. Lecturer |
| 21  | A.S. Barau      | Graduate Asst. |
| 22  | P. O. Ogenyi    | Graduate Asst. |

## ADMINISTRATIVE STAFF

| S/N | NAME                 | RANK                             |
|-----|----------------------|----------------------------------|
| 1   | Amina Ismail Shuaibu | Principal Confidential Secretary |
| 2   | Useini Hassan Dabong | Computer Operator                |
| 3   | Byencit J. Nimchak   | Senior Clerical Officer          |

## TECHNICAL STAFF

| S/N | NAME                      | RANK                   |
|-----|---------------------------|------------------------|
| 1   | Mohammed Rabi             | Snr Chief Technologist |
| 2   | Tyosar, Henry Orkuma      | Snr Chief Technologist |
| 3   | Irokalibe Michael Mahakwe | Snr Chief Technologist |
| 4   | Ashom Ishaku Nyam         | Snr Chief Technologist |
| 5   | Onobun Eihikioya Charles  | Chief Technologist     |
| 6   | Isa Wuti                  | Chief Technologist     |
| 7   | Ayila Ruth Mngu           | Technologist II        |
| 8   | Adisa H. Bolanta          | Technologist II        |
| 9   | Awangs Michael A.         | Snr. Lab. Supervisor   |
| 10  | Gwamle Nimmyel            | Lab Supervisor         |
| 11  | Anduwish Ladi M.          | Lab Supervisor         |
| 12  | Ubaliya Hassan            | Lab Supervisor         |
| 13  | Lakmar K. Dashe           | Lab Supervisor         |
| 14  | Gofwan Faith John         | Lab. Assistant         |
| 15  | Janet F. John             | Lab. Assistant         |
| 16  | Zippa Micheal             | Lab Assistant          |
| 17  | Muhammed L. Adamu         | Lab. Assistant.        |