

HAVILLA UNIVERSITY NDE, IKOM
CROSS RIVER STATE, NIGERIA

FACULTY OF HEALTH SCIENCES
DEPARTMENT OF MEDICAL LABORATORY SCIENCES



STUDENT HANDBOOK

HAVILLA UNIVERSITY NDE, IKOM

Student Handbook

Preamble

The Student Handbook is the official statement of rules and regulations guiding student conduct in Havilla University. All items contained in this book are in effect at the date of publication in September 2021. All rules, regulations, and policies are subject to change through the appropriate faculties, departments, units, offices, and legislative bodies empowered by the University Senate, the Vice Chancellor, and the Board of Trustees of Havilla University. Any change in the items contained in the Student Handbook will be published in the appropriate departmental media. All students are responsible for acquainting themselves with the contents of the Student Handbook. If questions arise, do not hesitate to call the Dean, Student Affairs' Office for clarification and/or assistance.

Introduction to Havilla University

It has always been the dream and aspiration of the owners of Steadyflow International Limited to nurture, train and produce dedicated and committed young men and women who shall become the curators, architects and transformers of society. This dream has been inspired by the personal experiences of the owners and the impact education has made in their lives. It is also inspired by the need to give something back to society as recompense and recognition for the benefits and blessings that they have received from their communities, societies and Nigeria in general. The Chancellor of Havilla University has identified education as the single most important tool for the emancipation of the individual and for the transformation of society.

The intent of Steadyflow International, the Proprietor of Havilla University, has also manifested in its engagement in the betterment of the lives of the less-privileged in society. To further actualize the dream, the Proprietor established the Steadyflow Nursery and Primary School, Abuja in 2001, the Steadyflow International High School, Abuja in 2007 and the Steadyflow College of Education, Akparabong, Ikom in 2012. The good intentions of the Proprietor of Havilla University and the successes recorded in the provision of education at the nursery, primary, secondary, and tertiary levels have fueled the drive that led to the establishment of Havilla University as a centre of academic excellence.

On November 6, 2021, the Unveiling Ceremony of Havilla University took place under the Chairmanship of Sen. Kanu Agabi, SAN, GCON, ably represented by Sen. Victor Ndoma-Egba, SAN. During the occasion, The Chairman, Board of Trustees, Prof. Florence Banku Obi, represented by the

Deputy Vice-Chancellor (Administration) of University of Calabar, performed the Investiture ceremony of the Pioneer Vice Chancellor of Havilla University, Prof. Samuel Tita Wara. Also on that occasion, the Representative of the Chairman of the occasion laid a foundation stone for the Proposed, Sen. Kanu Agabi Faculty of Law. Two others were duly honoured by the Chancellor of the University, the Administrative Block was renamed the Sen. Victor Ndoma-Egba Senate Building while the Female Hostel Complex was renamed, Prof. Florence Banku Obi Hall. The final event of the Unveiling Ceremony was the celebration of the retirement of Mrs. Blessing A. O. Tangban, a Board Member of the Proprietor, Director of Education at the Steadyflow Group of Schools and wife of the Chancellor. Mrs. Tangban who went on voluntary retirement from the Petroleum Equalization Fund Management Board after twenty years of service, launched her maiden book, "The Memoirs of an African Village Girl". Proceeds from the Book Launch were used to establish a Foundation for the Education of the Indigent Child at Havilla University.

Vision

The vision of Havilla University is 'to be a leading University recognized, nationally and internationally, for promoting innovations in teaching, research and public service through its academic programmes'.

Mission

The mission of the Havilla University is 'to transform the lives of its students and staff and empower them with knowledge, skills and values to enable them excel in their fields, achieve successes and transform their societies'.

Philosophy

The philosophy of the Havilla University is guided by a five-point agenda that focuses on the impact of the University on its staff and students and the world at large. These cardinal points are:

- i. **Knowledge creation** — this is rooted in the philosophy that knowledge is power. It holds the belief that learning illuminates the mind and also brightens the paths of human beings to progressive self-discovery, leading to innovative contribution to development. Knowing that ignorance is darkness and darkness leads to poverty of mind, Havilla University provides an atmosphere of academic liberty for in-depth discovery of mind and purpose;
- ii. **Student-centered** — this provides wide opportunities, resources and facilities to enhance students' learning in academic, moral and community activities. This way, an avenue that prepares young people

- to be intellectually sound, morally balanced and professionally proficient is instituted in Havilla University;
- iii. **Community-participatory** — this is to promote participatory management on the understanding that all stakeholders have contributory roles in the achievement of the goals and objectives of Havilla University;
 - iv. **Balancing Stability and Change** — with relevance to the rapidly changing social and technological revolutions of the 21st Century, the Havilla University creates a balance in retaining positive values while it strives to reverse the depth of poverty and place relevance on the institution of entrepreneurial education, job creation and value re-orientation; and
 - v. **Global Relevance** — this ensures that the learning, teaching and community services shall embrace international perspectives and the impact of globalization, while acting locally to meet societal needs. This is built on excellence on the academic and research programmes of Havilla University.

Objectives

The law establishing Havilla University has outlined its objectives aimed at meeting its vision and mission. The objectives of Havilla University are to:

- i. Encourage the advancement of learning and to hold out to all persons without distinction of race, creed, sex or political conviction the opportunity of acquiring a higher and liberal education;
- ii. Provide sources of instruction and other facilities for the pursuit of learning in all its branches, and to make those facilities available on proper terms to such persons as are equipped to benefit from them;
- iii. Encourage and promote scholarship and conduct research in all fields of learning and human endeavour;
- iv. Evolve academic programmes to suit the changing social and economic needs of society through continuous review of curricular and developments of new programmes through programme structural flexibility to respond to societal and technological changes;
- v. Create and expand access and opportunities for education, attract and retain quality students, researchers, and teachers, thereby assisting in developing human capital and mitigating the brain drain currently afflicting Nigeria;
- vi. Appreciate and stimulate interest in African and other regional cultural heritage and relating its activities to the social and economic needs of the people of Nigeria and the world;
- vii. Carry out basic and applied research leading to the domestication and application of new technology to the Nigerian context through

collaborative linkages with other academic and research institutions in Africa and the rest of the world;

- viii. Establish a centre for entrepreneurial studies to stimulate job creation and innovative abilities in students from onset of their studies, in such a way that graduates shall be resourceful, self-reliant and job creators; and
- ix. Undertake other activities appropriate for teaching, research and community service as expected of a university of high standard.

Steadyflow International Limited

Proprietor

Board Of Trustees of Havilla University

Prof. Florence B. Obi	Chairman
Hon. Jones A. O. Tangban	Member
Dr. Pius Tabi Tawo	Member
Barr. Christopher Agara	Member
Ms. Blessing Ayuk Tangban	Member
Barr. Tawo E. Tawo, SAN	Member
Pastor Olugbenga Olufisayo	Member
Dr. Antor Odu Ndep	Secretary

Hon. Jones Ayuk Ojong Tangban

Chancellor

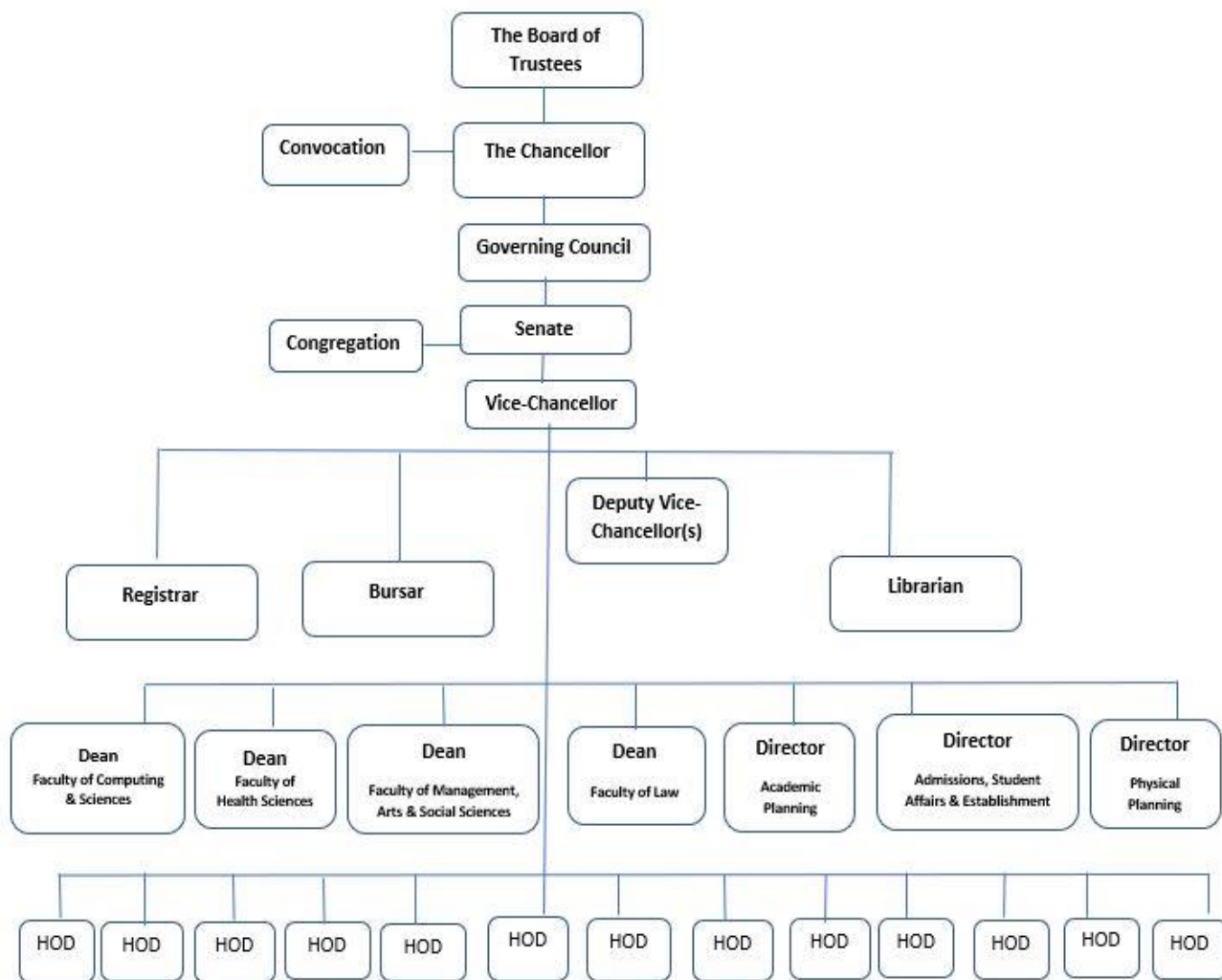
Principal Officers

Prof. Samuel Tita Wara	Vice Chancellor
TBD	Deputy Vice Chancellor (Academic)
TBD	Deputy Vice Chancellor (Administration)
TBD	Registrar
TBD	Librarian
TBD	Bursar

Other Officers

Dr. Antor Odu Ndep	Director of Academic Planning
Mrs. Helen Uzezi Wara	Director of Admissions, Student Affairs & Establishment
TBD	Director of Physical Planning

ORGANOGRAM OF HAVILLA UNIVERSITY



LIST OF EXISTING ACADEMIC STAFF

NAME OF ACADEMIC STAFF	AREA OF SPECIALIZATION	DISCIPLINE	QUALIFICATION	RANK
Prof. Samuel T. Wara	Power & Energy Systems	Electrical Engineering	B. Eng., M.Eng., PhD, FIMC, CMC, CMS, FNSE, FRHD, FIET, FICA, FRHD, R.Eng (COREN)	Professor
Dr. Antor Ndep	Health Education & Communication	Public Health	B.Sc., MPH, DrPH	Senior Lecturer
Dr. Augustine Peter Silas	Socio-linguistics; syntax	Linguistics	B.A., M.A., PhD	Lecturer I
Dr. Benson Efejadi Eguzozie	French	International Relations	Dip (Journalism), B.A., M.A., PhD	Lecturer II
Dr. Helen U. Wara	International Relations and Human Resource Management	Business Administrations	B.Sc., MBA, M.Sc., PhD	Lecturer II
Dr. Barizomdu Tina Pii	Analytical & Environmental Chemistry	Chemistry	BSc., MSc., PhD	Lecturer II
Dr. Cecilia James Sunday	Human Genetics	Biology	BSc., MSc., PhD	Assistant Lecturer
Mr. Owan Raphael Asu	Mathematics/Statistics	Statistics	HND, PGD, MSc.	Assistant Lecturer
Mr. Amechi E. Igharo	Macro-Economics	Economics	Dip. PA., B.Sc., M.Sc.	Assistant Lecturer
Mr. Raphael Asu Owan	Statistics	Mathematics & Statistics	Dip., HND, PGD, MSc.	Assistant Lecturer
Mr. Komomo Iwara	Information Technology	Computer Sciences	B.Sc., M.Sc.	Assistant Lecturer
Mr. Anthony Ibe	Geophysics	Physics	B.Sc., M.Sc.	Assistant Lecturer

General Admission Requirements

Admission into Havilla University is open to candidates with the requisite qualifications and subject to written and/or oral examination as the University may determine. All applicants for admission into the University must be at least 16 years of age. Admission into Havilla University is open to all irrespective of Religion, Ethnic Group, Gender, Creed, and Disability.

A general overview of the admission requirements are as follows:

- For admission to 100 Level (via UTME), candidates must: obtain five (5) credits at SSCE (or equivalent) in relevant subjects at not more than 2 sittings including credit passes in English and Mathematics; and attain acceptable points in UTME in relevant subjects.
- For admission by direct entry (200 Level), candidates must, in addition to having five (5) SSCE credits, obtain at least two (2) A' level (or its equivalent) passes in relevant subjects, or possess ND with credit passes, or possess a good first degree in another field as the case may be.
- Credit passes in English Language and Mathematics are compulsory for admission into all courses.
- Those who meet the requirements for admission shall be subjected to a screening interview to be conducted by the University.

Grading system

In evaluating the course work done by a student, a five-point grading system is adopted

Percentage Mark	Letter Grade	Grade Point	Description
70% - 100%	A	5	Excellent
60% - 69%	B	4	Very Good
50% -59%	C	3	Good
45% - 49%	D	2	Fair
40% - 44%	E	1	Pass
0% - 39%	F	0	Fail

Grade Point (GP)

Each grade has points attached to it. Since Havilla University runs a five point grading system, A is five points, B is four points, C is three points etc. see table above.

Credit Points (CP)

This is obtained by multiplying grade points obtained in each registered course by their respective credit units in a semester/session. If a student scored an A in Chemistry which is a 3-credit course, the Credit points obtained are $5 \times 3 = 15$.

Grade Point Average (GPA)

For each semester, the students' sum total credit points divided by total number of credit units from courses registered for that semester gives the Grade Point Average (GPA). The GPA is for one session only. By the end of the session, all Year One (100 Level) students normally get a GPA at the end of the first semester.

Cumulative Grade Point Average (CGPA)

This is the up-to-date mean of the grade point average (GPA) earned by the student in a programme of study. This is obtained by multiplying the GPA by the respective credit units for all the semesters, adding these and dividing the total sum by the total number of credit units for all courses registered by the student. For 100 Level students, CGPA can only be calculated by the end of the session (end of two semesters).

Note: 'NR' represents an incomplete result, and it is not use it for calculating CGPA.

How to Calculate GPA and CGPA

COURSE	CREDIT UNIT (X)	GRADE SCORE AND GRADE POINT (W)	TOTAL CREDIT POINTS (XW)	GPA = $\frac{\sum XW}{\sum X}$
GSS 101	2	B = 4	8	65/18 =3.61
MTH 111	3	A = 5	15	
PHY 101	3	B = 4	12	
BIO 101	3	C = 3	9	
CHM 101	3	A = 5	15	
PUH 101	2	D = 2	4	
GSS 131	2	E = 1	2	
TOTAL	$\sum X = 18$		$\sum XW = 65$	

CONDITIONS FOR PROBATION AND WITHDRAWAL**❖ Probation conditions**

Probation is a status granted to any student whose academic performance fall below the acceptable standard. There are two conditions that could place a student on probation status:

- i. Any student whose GPA or CGPA is **below 1.50 (1.00 – 1.49) OR**

- ii. Any student who has **15 credit units** of failed courses irrespective of CGPA at the end of an academic year earns a period of Probation for one session.

Students who are on Probation are expected to take **only the failed probation courses**. At the end of the probation year, a student may continue in the programme of study provided his/her CGPA is up to 1.50 or more. Otherwise, the student will be advised to change programme or withdraw from the University.

❖ **Withdrawal conditions**

A student whose GPA or CGPA drops below 1.00 (i.e., 0.01 – 0.99) or has more than 15 credit units of failed courses irrespective of CGPA will be withdrawn from the University.

GRADUATION REQUIREMENT

To graduate and for the award of any degree in Havilla University, the student must have completed and passed the prescribed courses and electives.

Classification of B.Sc. Degree

Below is the classification of degree results for graduation.

Cumulative Grade Point Average (CGPA)	Class of Degree
4.50 - 5.0	First Class (Hons)
3.50 - 4.49	Second Class (Hons) Upper Division
2.40 - 3.49	Second Class (Hons) Lower Division
1.50 - 2.39	Third Class (Hons)
0.99 – 1.49	Fail

**** Please note that there is no PASS class of degree**

Bachelor of Medical Laboratory Science

GENERAL INFORMATION

Bachelor of Medical Laboratory Science is offered in the Department of Medical Laboratory Science, Faculty Health Sciences of the University. The programme consists of four units: Medical Microbiology and Parasitology, Clinical Chemistry (Chemical Pathology), Haematology and Transfusion Sciences, and Histopathology. The programme runs for five (5) years leading to the award of Bachelor of Medical Laboratory Science (B.MLS) with specialization in any of units of the programme. Successful candidates are expected to gain general competence in all the unit areas during the first four

years but in the final year they are expected to specialize in any unit areas. To train up a Scientist knowledgeable in wider areas of life, some language studies, business studies, conflict resolution etc. are introduced at convenient levels of the programme. The resultant Medical Laboratory Scientist can fit into various areas of life such as diagnostic procedures, researches, production of biological products business, politics etc.

PHILOSOPHY

The broad philosophy of training in medical laboratory sciences is to:

- a) To provide sound academic and professional background for the production of Medical Laboratory Scientists who would be capable of working anywhere in Nigeria.
- b) To produce Medical Laboratory Scientists who would satisfy internationally recognizable standards and who could undertake further training towards specialization.
- c) To produce Medical Laboratory Scientists with sufficient management ability to play a leadership role and entrepreneurship in employing others, establishing self, and also in training and general practice of laboratory sciences.

Objectives

The main objectives of Bachelors honors degree programmes in Medical Laboratory Sciences is to:

- i) To inculcate in student a sense of eagerness for the profession of Medical Laboratory Science; an appreciation of its application in different areas such as diagnostic processes in health institution and quality control in food and beverages industries, pharmaceutical industries and utility areas such as water corporations, research institutions, etc).
- ii) To equip students with a broad and balanced foundation of Medical Laboratory Science knowledge and practical skills to performing effectively in clinical diagnostic services, academics and quality assurance; and function independently or in collaboration with other members of the health care professionals

in the care of individuals and groups of persons at all levels of health care.

- iii) To build in students, the ability to apply their Medical Laboratory Science knowledge and skills to solve, through troubleshooting, theoretical and practical problems in laboratory medicine.
- iv) To produce in students with the ability to produce biological and diagnostic reagents as well as being able to fabricate and maintain laboratory equipment.
- v) To expose the students to some non-medical (**an innovation**) courses such as **GST courses** (Communication in English, Philosophy and Human Existence, Information and Communication Technology, Nigeria People and Culture, Peace Studies and Conflict Resolution, Government and Political Institution) and **HUNI courses** such as Leadership, Mental hygiene, stress management, Entrepreneurial Studies and Language Acquisition - Chinese, French, Hausa, Igbo, Yoruba) for wider knowledge and total human development.

BASIC ADMISSION REQUIREMENTS

Candidates seeking enrolment into the B.MLS programme should possess the following minimum entry qualifications:

- i) Senior Secondary School Certificate or its equivalent at credit levels in Physics, Chemistry, Biology, English Language and Mathematics at not more than two sittings, together with an appropriate pass in the Unified Tertiary Matriculation Examinations (UTME). NABTEB certificate is acceptable.
- ii) Direct Entry
Candidates with pass in the General Certificate of Education (GCE) at advanced level in Physics, Chemistry and Biology (or Zoology) and also with a minimum of 5 credits in the following subjects – Physics, Chemistry, Biology, English Language and Mathematics at ‘O’ level: in addition to satisfying the minimum

entry requirements through JAMB, or graduates with at least a second class honors degree (2²) in related disciplines such as Zoology, Microbiology, Anatomy, Physiology, Biochemistry as approved by the senate of the university, but must also have a minimum of 5 credits in the subjects stipulated at 'O' level. Holders of Medical Laboratory Technician (MLT) Certificate who must also have a minimum of 5 credits in the subjects stipulated at O' level are eligible.

iii) Transfer students

Candidates can transfer from other departments in the college of Medicine and Health Sciences with CGPA of not less than 3.50

THERE IS NO DEFERRED ENTRY REQUIREMENT

INTER AND INTRA UNIVERSITY TRANSFER

The department will not ordinarily entertain this. However, the department has the prerogative for discretionary transfer. The factors to be considered are;

- a) Senior Secondary School Certificate with credit in Physics, Chemistry, Biology, Mathematics and English language.
- b) Relevant pass in the Joint Matriculation Examination (JME)
- c) Cumulative grade point (CGPA) not less than 3.5 with no carry over courses still outstanding.
- d) Candidate from other university should have taken and passed relevant courses from BMLS in their respective Universities in addition to the above requirements [a-c]
- e) Candidate who has been asked to withdraw from other faculty and / or university shall not be considered for admission to the department.
- f) Transfer candidate have to satisfy the interview panel of the department and shall be limited in number to not more than 5% of the admission quota.

- g) Any candidate wishing to change to the department from a relevant department /faculty (as found in Sect 3.0 (ii)c above) must have spent at least one [1] academic session in the university.

NOTE: Students for B.MLS programme are required to register with the Medical Laboratory Science Council of Nigeria as a student member at the point of entry into 300 Level. Any student found unqualified shall withdraw from the programme forthwith.

Duration of Semester

Each semester of 15 weeks (exclusive of the Christmas and Easter vacation or Mid-semester breaks) shall normally be reserved for teaching and two weeks for examination. This is applicable to 100 and 200 level of the programme but for 300 to 500 levels a semester is six (6) months, this will allow for Laboratory posting in the University Teaching Hospital. Each MLS course taught in the B.MLS programme at the university may be evaluated for grading with the use of one or several of the following criteria:

Written examination which include problem solving:-

- 1) (a) Essay; six (6) questions to attempt four (4) for 2 unit course and 7 questions to attempt five (5) for 3 unit course (b) Multiple choice question (MCQ) 40 questions to attempt all.
- 2) Laboratory, presentation or demonstration to the class of exercise/techniques.
- 3) Laboratory report.
- 4) Laboratory log book or case studies
- 5) Continuous assessment tests.

CONTINUOUS ASSESMENT

Continuous assessment (CA) shall form part of the end- of- course grade. Its overall contribution shall not be more than 30% of each course examination.

GRADING OF COURSES

The NUC general rule on grading of courses shall apply to 100 and 200 level courses, while grading for 300 - 500 level courses shall be 50%.

A student shall be deemed to have passed his/ her examination if he or she passed the compulsory and required course he/she registered for during the academic year. Any 500 level student with outstanding courses will be required to register and pass the courses before registering for final professional examination.

CARRY OVER COURSES

A candidate who fails any course during any academic year may repeat or carry over the course(s) while at the next higher course level provided that the candidate meet the requirement to remain in the department at the end of academic session. However, no candidate will be allowed to proceed to 300 Level except he/she passed the failed courses at 100 - 200 Levels. This is because 300 level marks the beginning of clinical posting which requires students to be out of school for hospital posting and will not be available on campus to attend to the carryover courses.

Grading System for Basic Science Courses (100 level – 200 level)

Below is the grading system

Mark Range Point	Letter Grade	Grade
70 – 100	A	5
60 – 69	B	4
50 – 59	C	3
45 – 49	D	2
0 – 44	F	0

Assessment and Class of Degree

Class	C.G.P.A
First	4.5 – 5.0
Second Class Upper	3.50 – 4.49
Second Class Lower	2.50 – 3.49
Third Class	1.5 – 2.49

Grading System MLS Courses (300 level – 500 level)

Below is the grading system

Mark Range Point	Letter Grade	Grade
70 – 100	A	5
60 – 69	B	4
50 – 59	C	3
0 – 49	F	0

Final Assessment and Class of Degree

Class	C.G.P.A
First	4.5 – 5.0
Second Class Upper	3.50 – 4.49
Second Class Lower	2.50 – 3.49
Third Class	1.5 – 2.49

For the purpose of determining the class of degree the C.G.P.A. shall cover 100 to 500 level courses

A Summary of Credit Load for the Programme

LEVEL	CREDIT LOAD	TOTAL CREDIT LOAD
100	43	43
200	55	98
300	44	142
400	42	184
500		
Chem. pathology	39	223
Haematology/BTS	39	223
Histopathology	39	223
Med. Microbiology	39	223

Graduation requirements

- 1) Minimum number of credit hours: 227
- 2) Minimum number of years of the course: 5 years (UME) and 4 years (DE).

Requirements for the award of Degree in the Department

For any student pursuing any degree program for any of the options in the department, he or she must satisfy the following conditions:

- (i) Must have passed all the compulsory courses
- (ii) Must have obtained pass mark in all the required courses
- (iii) Must have obtained satisfactory report from the University Teaching Hospital (Laboratory Posting programme) wherever such student was attached for that period
- (iv) Must have met all other conditions stated in the regulations for the award of degree of the University.

Caution, Probation and Withdrawal from the programme

A student whose C.G.P.A. falls below 2.5 at the end of first session shall be placed on caution during the following session. If he then fails to achieve a C.G.P.A of at least 2.5 at the end of the first semester of the subsequent session he shall be placed on probation. A student on probation shall not carry more than minimum load of 18 units for the semester for which he/she is on probation. A student who is unable to get out of probation at the end of the session, shall be required to withdraw from the programme, but a student who is out of probation at the end of the session shall be allowed to carry a maximum load unit during the following semester.

Examination Malpractice

Any students involved in University Examination Malpractice or violate examination regulations, shall be referred to the college disciplinary committee for appropriate action.

Procedure for Investigating Alleged Examination Misconduct

1. Whenever a student is caught for any examination offence, the case shall be reported to the invigilator/supervisor in the hall immediately.
2. The invigilator shall fill the necessary forms reporting the case of examination misconduct and the student shall be made to write a statement on his or her involvement. The student shall be made to continue with the examination.

3. The invigilator/supervisor shall then report formerly to the college examination officer who would report officially to the Provost.
4. The provost forwards the allegations to the Examination Malpractice committee for proper investigation within 48 hours. The committee reports back her findings to the provost within 48 hours.
5. The report of the college preliminary investigation carried out by the committee must be ready within two weeks, and shall be forwarded to the Vice-Chancellor by the Provost of the affected College.
6. The Vice-Chancellor on receiving the report shall send it to the Students' Disciplinary Committee for determination and recommendation to him.
7. The student Affairs Unit, on receiving the report of the preliminary investigation, will frame appropriate charges against the student. The student will be asked to defend himself/herself against the charges preferred against him/her in writing submitting a written statement of same. The student will then be invited to appear before the SDC to defend himself/herself verbally.
8. The Students' Disciplinary Committee shall read the charges preferred against the offender to him or her, and allow him or her to defend himself or herself in the light of his/her statements which he/she has earlier submitted.
9. The report and recommendations of the Students' Disciplinary Committee shall be forwarded to the Vice-Chancellor for consideration and approval.
10. Student(s) may appeal against the decision of the SDC to council within 14 days.

Absence from Examination

A student who is absent from a course examination without the permission of the University during or at the end of the semester, automatically fails the course. Permission may be granted only on substantial compassionate or health grounds as approved by the University.

ATTENDANCE POLICIES

(1) Attendance to lectures and laboratory posting is compulsory and absence from the class or laboratory will affect student's final grade. Missed laboratory work or examination must be completed.

(2) A minimum of 75% attendance to Lectures and laboratory posting is a prerequisite to sitting for semester examination and professional examination. Failure to meet up with this minimum requirement will be tantamount to carry over of the entire course or posting. Students are therefore advised not to miss any laboratory session.

(3) Protracted illness (three consecutive days or more) should be reported to the Head of Department promptly.

(4) Student shall continue their laboratory posting during holidays and this shall serve as their industrial attachment programme.

(5) Final year students to take all call duties in their respective discipline. They are to be attached to Medical Laboratory Scientist on call. This shall be their graded part of the 75% attendance laboratory posting.

PROFESSIONAL EXAMINATION.

Students are required to have passed all courses to qualify for any of the professional exams (for first professional exams 100 level-400 level courses; final professional exams 100 level -500 level).

The professional examination shall be in two parts viz;

First professional examination to be held at the end of second semester of the fourth year shall consist of two parts;

- a) Consist of practical examination in Medical Microbiology, Parasitology, Haematology, Blood Transfusion Science, Chemical pathology. Questions shall include practical oriented MCQ, practical examination, spot test and viva (oral) examination. A student must pass first professional examination to proceed to 500 level.
- b) **Final professional examination** shall be at the end of the second semester of 500 level, which shall consist of written examinations, practical and oral examination in the specialty/discipline of the candidate and project work defense.

Note: Pass mark in both examinations is 50%.

Re-sit examination shall be conducted at the next available/convenient time as may be deemed fit by the Department and MLSCN.

COURSE CODE SYSTEMS:

Course code contains an abbreviated letter code of three (3) letters and three digits MLS is a prefix that indicate the department.

The first digit represents the level of study. For 100 – 400 levels the second digit denotes the semester while for 500 levels the second digit denotes specialty area. The third digit denotes the topic/stress area.

POLICY STATEMENT ON THE COURSE UNIT SYSTEM FOR BMLS PROGRAMME

Havilla University has adopted course unit system for the BMLS programme with modification. The department of medical laboratory science, college of Medicine and Health Sciences is hosting the Bachelor of Medical Laboratory Science programme and is adopting the Course Unit System of the University with slight modifications in awarding the bachelor degree. It is also important to note that at the end of the 5-year programme, the medical laboratory science council of Nigeria will register graduates of the programme as Associate of the Medical Laboratory Science Council of Nigeria (AMLSCN) in addition to the BMLS certificate of the university.

MODIFICATION IN THE AWARD OF THE DEGREE OF THE BACHELOR OF MEDICAL LABORATORY SCIENCE (BMLS)

The modifications are as follows:

1. The 100 level courses involve basic sciences of the programme and this is the entry point for students without “A” level General Certificate of Education or BSc. In sciences. It is the entry point for candidates who meet the entry requirement for BMLS programme after passing the JAMB examination and post JAMB screening examination of the university. A total of 24 courses will be taken by the students at this level. The minimum grade to pass a course is E i.e. 45 out of maximum 100 marks available.

2. The students are allowed to proceed to 200 level irrespective of the grades they scored. The only handicap for the student is the number of carryovers which can have major effect on the number of courses the student could register for at 200 level, since the university will not allow a student to register for courses exceeding 24 credit units. For direct entry students to 200 level, the student must take all available 200 level courses along with GST courses applicable for the Faculty of Health Sciences students. A student may be required to take other courses if his transcript suggests any deficiency in the course.
3. There is no prerequisite for any of the 200 level courses at the moment; however, this might change in the future. Some of the changes expected in the nearest future are that 100 level Biology and Chemistry courses will be prerequisites for any of the 200 level biochemistry courses. Moreover, 100 level Biology courses will be prerequisite for Anatomy and Physiology; while 100 level Physics, Chemistry and Biology courses will be prerequisites for 200 level courses in Medical Laboratory Science (MLS201 and MLS202)
4. Each student is required to score at least a minimum grade (D) i.e. 45 in all the 100 level courses before attempting any 300 level courses irrespective of whether they are compulsory or elective.
5. As stipulated in the university policy, each student is required to satisfy the minimum attendance of ninety percent (75%) before the student can sit for the end of semester examination.

From 300 level upward, there is no major restriction of the courses the student can take. The only exception is the course - laboratory posting, having satisfied the prerequisites for 300 level courses.

1. Failure in the 1st professional examination will require the student to write a re-sit at the next available opportunity. If the re-sit is failed again, the student proceeds on compulsory laboratory posting till the next first professional examination.
2. To be awarded the degree of B.MLS of Havilla University, a student must pass all the courses offered by the university in addition

to all the professional examinations conducted in collaboration with the Medical Laboratory Science Council of Nigeria (MLSCN).

3. The class of degree awarded will be in line with the university grading policy. All results are subjected to university's senate approval.

POLICY STATEMENTS OF THE DEPARTMENT ON THE 1ST PROFESSIONAL EXAMINATION

The Department will conduct the 1st professional examination with the MLSCN moderating. In order to accord the examination its rightful place, the following rules apply:

1. The student must pass all the 100 to 400 level Medical Laboratory Sciences core courses before the student can be allowed to sit for this examination. Failure to get the minimum grade in any of the core courses will prevent the student in taking the examination.
2. The 1st professional examination is mainly practical examination in which students are assessed in all the practical aspect of all the Medical Laboratory Science Courses (Medical Microbiology and Parasitology, Haematology and Blood Group Serology, Chemical Pathology and Histopathology) and oral/viva-voce examination
3. The pass mark for this examination is 50 out of 100 maximum marks available. The total mark scored by each student will be sum of the MCQ, log book, practical and oral/ viva examination. However, the practical examination must be passed at a minimum of 50% to pass this examination regardless of the total score.
4. The examination will be moderated by the MLSCN in which the council is expected to send a representative to the university.
5. The chief examiner will be the current Head of Department of Medical Laboratory Science, College of Medicine and Health Sciences, Havilla University Nde, Ikom, Cross River State.
6. It is important that this professional examination is adequately funded in order to prevent the council withdrawing the departmental accreditation.

7. The Department needs to transmit the results of the examination to the Provost of the College for his information alone.
8. The results (MLS 402) can be approved executively by the Vice Chancellor of the University on behalf of the senate or the senate of the university.
9. The final results should be released within a week of the conduct of the examination.
10. Students who fail the first professional examination will be required to write a re-sit at the next available opportunity.
11. Students who fail the re-sit examination would be required to go back to the laboratory for compulsory posting for the duration of time before the next first professional examination.

POLICY STATEMENTS OF THE DEPARTMENT ON THE FINAL PROFESSIONAL EXAMINATION

The department is also conducting the final professional examination in all the disciplines the department has to offer with the MLSCN moderation. In order to accord the examination its right place, the following rules apply:

1. Failure in any of the courses from 100-500 level is not allowed in this examination that will be held shortly after the second semester examination for the 500 level students. It is a zero-tolerance examination in terms of eligibility.
2. The final professional examination consists mainly of MCQ, practical examination and oral/viva voce examination, in which students are assessed in the final year discipline (Medical Microbiology and Parasitology, Haematology and Blood Group Serology, Chemical Pathology and Histopathology) of choice of students.
3. It is expected that the MLSCN will send examiners in each of the disciplines the department has to offer. A minimum of four examinations with each examiner representing each discipline.
4. The overall pass mark for this examination is 50 out of 100 maximum mark which constitutes of the sum of scores from MCQ, log book, practical and oral/viva examination. However, the practical score must be a minimum of 50% to pass the examination.

5. The chief examiner is the current Head of Department of Medical Laboratory Science, Faculty of Health Sciences, Havilla University Nde, Ikom with the assistance of the unit's heads. Internal examiners are to be appointed from the department.
6. It is important that this professional examination is adequately funded in order to prevent the council withdrawing the department's accreditation.
7. The Department needs to transmit the results of the examination to the Dean of the Faculty of Health Sciences for his information alone.
8. The results (MLS 502) can be approved executively by the Vice Chancellor of the University on behalf of the senate or the senate of the university.
9. The final results should be released within a week of the conduct of the examination.
10. Student who fail the final professional examination will be required to write a re-sit at the next available opportunity (Usually after three months where possible).
11. Students who fail the re-sit examination would be required to go back to the laboratory for compulsory posting for the duration of time before the next final professional examination. In addition to this, the affected student cannot be mobilized for NYSC or internship. In line with the university policy, the student must register for courses (not less than 11 credit hours which can be chosen from other disciplines of Medical Laboratory Sciences at 500 level) and pay the necessary fees due to the university. In essence, the student is a regular student of HUNI.

CONDUCT OF EXAMINATIONS:

Examination and Evaluation

Students will be examined and evaluated in all courses registered for. Basic theoretical courses will be evaluated through continuous assessments and end of semester examination. It is mandatory for students to perform satisfactorily in both the continuous assessment and

examinations to progress in the student's choice of study. Various methods of evaluation to be adopted are as described below:

- **Continuous Assessment:** This may be in form of an assignment, mid-semester test or group work as may be deemed necessary by the lecturer and class attendance. Continuous Assessment will be employed as a veritable tool to evaluate student's knowledge and understanding of all they have been exposed to through lectures, discussions, assignments and personal reading. Continuous Assessment and attendance will carry not more than 30% of the total mark for each course.
- **Group Work:** Here students are given liberty to discuss with fellow group members for individual conclusion to be drawn
- **Assignments:** These will be graded by lecturers. The University frowns at any student who 'steals' ideas from fellow students or plagiarizes. It is expected that all assignments will be written in English Language. Completion of assignments by students and marking by staff will be tied to time, as deadlines will be given for both. Marked scripts will be returned to students on specified dates to enable students read the lecturer's comment and evaluation. The university will orientate all appointed lecturers with the principle of fairness, diligence and conscientious service. A process of seeking redress by aggrieved students will be instituted
- **Examination:** this is used for students' overall performance during the semester. There will be a mid-semester test and an end-of-semester examination in all the courses offered. Student will be expected to make themselves available for these tests and examination. They will be examined in all courses offered based on the lectures given by the lecturers, recommended texts, assignment and research work during the semester. Each college and Department will make the time table available at least two weeks to the commencement of the examination. Use of mobile phones and other communication equipment will not be allowed in the examination hall as they will be regarded as tools for examination

malpractices. Both the examination and continuous assessment will be used for final grading. Examination carries 70%, continuous assessment and class attendance 30%.

- **Class Attendance:** Every student must have at least 75% class attendance at the end of each semester. Any student who falls below this requirement will not be allowed to sit for the end-of-semester examination except as a result of unforeseen circumstances which the University is privy to. Hundred percent attendance qualifies the student for 10mrks.
- **Project:** A student is expected to undergo an independent but supervised project before he completes his degree programme. The project will carry six compulsory units in all undergraduate programmes. No student will be allowed to graduate without evidence of completion of his/her independent research work.

GENERAL CODE OF CONDUCT

Accommodation

Havilla University is a fully residential institution. Students are not allowed to go out of campus at will. Should there be need for a student to go out of campus, appropriate permissions must be obtained which includes a verbal or written permission from the parent or guardian on record.

Class attendance

All students must meet 75% attendance rate for any course in order to qualify for the end of Semester/sessional examinations.

Cooking in the hostel

Students are not allowed to cook in the hostels. All students are expected to eat from the cafeteria. Any violation of this rule will result in expulsion.

Cults/confraternities

Havilla University has zero tolerance for students with cult/confraternities affiliations. Any student that joins, organizes or encourages others to join such, or participates in cult-related activities within or outside the campus shall be expelled.

Ikom fire crusade

All students are required to participate in Ikom Fire Crusade activities which involves feeding and clothing widows and orphans as well as health, spiritual growth and life skills seminars.

Meet the chancellor

Every semester, a date shall be announced for a motivational session with the Chancellor.

Religious activities

There shall be a mid-week service every Wednesday at 5:30pm at the University Worship Center (UWC).

Sports

All students are to participate in sporting activities. It is our belief that everyone has some sporting ability. We intend to groom and raise champions who will compete favourably at all levels; local, national, international/Olympics.

Dress code

All students are expected to dress modestly at all times on and off campus.

- a. Bump shorts and ultra-miniskirts are prohibited.
- b. All short dresses (above the knee length) must be worn over tights
- c. Tights must be worn with shirts or dresses that cover the buttocks
- d. Raggedy jeans are not allowed for both males and females
- e. Transparent shirts/blouses must be worn with the appropriate inner shirts
- f. Students must be clean shaven at all times.
- g. Male haircut must not be higher than one centimetre.
- h. For females, multi-coloured and ultra-long braids are not allowed

DETAILED DESCRIPTION OF ACADEMIC PROGRAMMES AND COURSES

GENERAL STUDIES COURSES FOR FIRST SEMESTER

s/n	Course Code	Course Title	Credit Units
100 LEVEL			
1	GST 111	Communications in English I	2
2	GST 121	Use of Library, Study Skills & Information Communication Technology (ICT)	2
3	GST 131	Nigerian Peoples & Culture	2
200 LEVEL			
1	GST 211	History & Philosophy of Science	2
300 LEVEL			
2	GST 311	Introduction to Entrepreneurial Skills	2

GENERAL STUDIES COURSES FOR SECOND SEMESTER

s/n	Course Code	Course Title	Credit Units
100 LEVEL			
1	GST 112	Logic Philosophy & Human Existence	2
2	GST 122	Communication in English II	2
3	GST 132	Communication in French	2
200 LEVEL			
1	GST 212	Peace Studies & Conflict Resolution	2
2	GST 222	Introduction to Entrepreneurial Studies	2

Note that students must pass all GST courses in order to graduate.

FIRST SEMESTER 100 LEVEL

s/n	Course Code	Course Title	Credit Units
1	GST 111	Communications in English I	2
2	GST 121	Use of Library, Study Skills & Information Communication Technology (ICT)	2
3	GST 131	Nigerian Peoples & Culture	2
4	MTH 101	General Mathematics I	3
5	PHY 101	General Physics I	2
6	PHY 107	Practical Physics I	1
7	BIO 101	General Biology I	2
8	BIO 107	Practical Biology I	1
8	CHM 101	General Chemistry I	2
9	CHM 107	Practical Chemistry I	1
10	CSC 101	Introduction to Computer Science	3
11	STS 101	Introduction to statistics	3
TOTAL CREDIT UNITS			24

SECOND SEMESTER 100 LEVEL

s/n	Course Code	Course Title	Credit Units
1	GST 112	Logic Philosophy & Human Existence	2
2	GST 122	Communication in English II	2
3	GST 132	Communication in French	2
4	MTH 102	General Mathematics II	3
5	BIO 102	General Biology II	2
6	BIO 108	Practical Biology II	1
7	CHM 102	General Chemistry II	2
8	CHM 108	Practical Chemistry II	1
9	PHY 102	General Physics II	2
10	PHY 108	Practical Physics II	1
11	PHY 122	Wave Optics and Modern Physics	3
11	CSC 102	Introduction to Problem Solving	3
TOTAL CREDIT UNITS			24

FIRST SEMESTER 200 LEVEL

s/n	Course Code	Course Title	Credit Units
1	GST 221	History & Philosophy of Science	2
2	MLS 201	Introduction to Medical Laboratory Science I	3
3	ANA 205	General Embryology	2
4	ANA 207	Gross Anatomy I	3
5	ANA 217	Histology and Histochemistry	2
6	PHS 207	General introduction and Renal Physiology	3
7	PHS 209	Membranes Heart and Respiration Physiology	3
8	BCH 201	Introduction to Biochemistry I	3
8	BCH 203	Protein Chemistry and Enzymology	2
9	BCH 205	General Methods in Biochemistry	1
TOTAL			24

SECOND SEMESTER 200 LEVEL

s/n	Course Code	Course Title	Credit Units
1	GST 222	Peace Studies & Conflict Resolution	2
2	GST 223	Introduction to Entrepreneurial Studies	2
3	MLS 202	Introduction to Medical Laboratory Science II	3
4	MCB 202	General Microbiology	2
5	BCH 202	Clinical Biochemistry and Xenobiotics	2
6	BCH 204	Medical Biochemistry II	3
7	BCH 206	Nutritional Biochemistry	1
8	PHS 208	Gastrointestinal Tract, Autonomic Nervous System	2
9	PHS 210	Endocrinology, Reproduction and PNS	2
10	ANA 214	Histology of special senses & Neurohistology	3
11	ANA 208	Gross Anatomy II	2
TOTAL			24

FIRST SEMESTER 300 LEVEL

s/n	Course Code	Course Title	Credit Units
1	GST 311	Entrepreneurship Trade Skills (PRACTICAL)	2
2	MLS 301	Laboratory Posting I	3
3	MLS 303	Medical Laboratory Science Ethics	2
4	MLS 305	General Pathology Medical Physics	2
5	MLS 307	Basic Immunology	2
6	MLS 309	Basic Clinical Chemistry	3
7	MLS 311	Basic Haematology	3
8	MLS 313	Basic Histopathology	2
8	MLS 315	Medical Microbiology	2
9	PHM 301	Introductory Pharmacology and Toxicology I	3
TOTAL			24

SECOND SEMESTER 300 LEVEL

s/n	Course Code	Course Title	Credit Units
1	MLS 302	Laboratory Posting II	3
2	MLS 304	Laboratory Instrumentation & Techniques	3
3	MLS 306	Fundamental Blood Group Serology	3
4	MLS 308	Introduction to Public Health	2
5	MLS 310	Laboratory Management & Organisation	2
6	MLS 312	Medical Parasitology	2
7	MLS 314	Medical Physics	2
8	MLS 316	Supply Chain Management	1
9	PHM 302	Introductory Pharmacology and Toxicology II	3
TOTAL			21

FIRST SEMESTER 400 LEVEL

s/n	Course Code	Course Title	Credit Units
1	MLS 401	Laboratory Posting III	3
2	MLS 403	Medical Parasitology & Entomology	3
3	MLS 405	Basic Medical Bacteriology and Mycology	3
4	MLS 407	Haemoglobin, Haemoglobinopathy & Myeloproliferation	3
5	MLS 409	Biotechnology and Bioinformatics	2
6	MLS 411	Analytical Chemistry	3
7	MLS 413	Human Cytology	2
8	MLS 415	Nucleic Acid Biochemistry	2
TOTAL			21

SECOND SEMESTER 400 LEVEL

s/n	Course Code	Course Title	Credit Units
1	MLS 402	Laboratory Posting IV	3
2	MLS 404	Biostatistics	2
3	MLS 406	Virology	3
4	MLS 408	Histopathology Techniques & Museum	3
5	MLS 410	Biomedical Engineering	2
6	MLS 412	Blood Group Systems Compatibility Tests	3
7	MLS 414	Counseling Skills	2
8	MLS 416	Immunology/ Immunochemistry	3
TOTAL			21

First professional examination-practical and viva

CHEMICAL PATHOLOGY (SPECIALTY CODE 010)**FIRST SEMESTER 500 LEVEL**

s/n	Course Code	Course Title	Credit Units
1	MLS 501	Laboratory Posting V	3
2	MLS 503	Seminar	2
3	MLS 505	Research Methodology	3
4	MLS 511	Carbohydrates, Protein and lipid Metabolism	3
5	MLS 513	Renal, Liver and Neurochemistry	3
6	MLS 515	Clinical Enzymology	3
7	MLS 517	Nutrition and Clinical Vitaminology/ Trace elements	2
TOTAL			19

SECOND SEMESTER 500 LEVEL

s/n	Course Code	Course Title	Credit Units
1	MLS 502	Laboratory Posting VI	3
2	MLS 504	Genetics & Molecular Biology	2
3	MLS 506	Project	6
4	MLS 512	Drug Monitoring, Toxicology and Inborn error of metabolism	3
5	MLS 514	Clinical and Reproductive Endocrinology	3
6	MLS 516	Techniques in Clinical Chemistry	3
TOTAL			20

FINAL PROFESSIONAL EXAMINATION-PRACTICAL AND VIVA**HAEMATOLOGY & BLOOD TRANSFUSION SCIENCE (SPECIALITY CODE 020)****FIRST SEMESTER 500 LEVEL**

s/n	Course Code	Course Title	Credit Units
1	MLS 501	Laboratory Posting V	3
2	MLS 503	Seminar	2
3	MLS 505	Research Methodology	3
4	MLS 507	Human Cytogenetics	2
5	MLS 521	Haemoglobin, Haemoglobinopathy & Myeloproliferation	3
6	MLS 523	Blood Group System & Compatibility Tests	3
7	MLS 525	Serology & Blood Transfusion Science	3
TOTAL			19

SECOND SEMESTER 500 LEVEL

s/n	Course Code	Course Title	Credit Units
1	MLS 502	Laboratory Posting VI	3
2	MLS 504	Genetics & Molecular Biology	2
3	MLS 506	Project	6
4	MLS 522	Advance Blood Group Serology Techniques	3
5	MLS 524	Coagulation And Fibrinolysis	3
6	MLS 526	Advance Haematological Techniques	3
TOTAL			20

FINAL PROFESSIONAL EXAMINATION –PRACTICAL AND VIVA**HISTOPATHOLOGY AND CYTOLOGY (SPECIALITY CODE 030)****FIRST SEMESTER 500 LEVEL**

s/n	Course Code	Course Title	Credit Units
1	MLS 501	Laboratory Posting V	3
2	MLS 503	Seminar	2
3	MLS 505	Research Methodology	3
4	MLS 507	Human Cytogenetics	2
5	MLS 531	Fundamental Histopathology	3
6	MLS 533	Systemic Histopathology	3
7	MLS 535	Fundamental Histochemistry	3
TOTAL			19

SECOND SEMESTER 500 LEVEL

s/n	Course Code	Course Title	Credit Units
1	MLS 502	Laboratory Posting VI	3
2	MLS 504	Genetics & Molecular Biology	2
3	MLS 506	Project	6
4	MLS 532	Exfoliative Cytology	3
5	MLS 534	Histopathology Techniques/ Embalmmment	3
6	MLS 536	Museum Techniques	3
TOTAL			20

FINAL PROFESSIONAL EXAMINATION –PRACTICAL AND VIVA

MEDICAL MICROBIOLOGY (SPECIALITY CODE 040)**FIRST SEMESTER 500 LEVEL**

s/n	Course Code	Course Title	Credit Units
1	MLS 501	Laboratory Posting V	3
2	MLS 503	Seminar	2
3	MLS 505	Research Methodology	3
4	MLS 541	Systemic Bacteriology	3
5	MLS 543	Advance Medical Parasitology & Epidemiology	3
6	MLS 545	Advance Entomology	2
7	MLS 547	Medical Mycology	3
TOTAL			19

SECOND SEMESTER 500 LEVEL

s/n	Course Code	Course Title	Credit Units
1	MLS 502	Laboratory Posting VI	3
2	MLS 504	Genetics & Molecular Biology	2
3	MLS 506	Project	6
4	MLS 542	Medical Virology	3
5	MLS 544	Pharmaceutical Microbiology & Microbial Genetics	3
6	MLS 546	Laboratory Techniques In Microbiology	3
TOTAL			20

FINAL PROFESSIONAL EXAMINATION –PRACTICAL AND VIVA**COURSE DESCRIPTIONS**

CHM 107 General Chemistry I (Practical) 1 Unit

CHM 101 General Chemistry I 2 Units

This course covers the structure of atoms, molecules, chemical equations in the calculation, chemical reactions, chemical principles, periodicity, chemical bonding, chemistry of representative elements, nomenclature, and classes of mass action, reactions, etc. The gas laws, kinetic theory of gases, the law of mass action, reaction radon, thermochemistry, chemical equilibrium, electrolyte and ionic equilibrium, theory of acids, bases and indicators, absorption chromatography etc.

PHY 107 General Physics I (Practical) 1 Unit

PHY 101 General Physics I 2 Units

bases and indicators. Phase equilibrium study of one and two components systems. The theory and practise of simple volumetric and qualitative analysis. Simple organic preparations, reactions of functional groups and physical determinations.

PHY 101: GENERAL PHYSICS I (MECHANICS)

Units and dimensions. Scalars and Vectors. Linear and circular motion; velocity, acceleration. Laws of mechanics and gravitation, simple applications. Conservation of energy, momentum, work, power, simple harmonic motion, simple pendulum. Moment of inertia Angular momentum; centrifugal and centripetal forces, centrifuges.

PHY 103: GENERAL PHYSICS III (PROPERTIES OF MATTER)

Elasticity, Hooke's Law, Young Modules. Fluid, pressure, surface tension, viscosity, osmosis; blood pressure and its measurement.

PHY 107: GENERAL PHYSICS LABORATORY I

This introductory course emphasizes quantitative measurements, the treatment of measurement errors and graphical analysis. A variety of experimental techniques will be employed. The experiments include studies of meters, the oscilloscope mechanical systems, electrical and mechanical resonant systems, light, heat, viscosity, etc. covered in PHY 101.

STAT 101: INTRODUCTORY STATISTICS

Permutation and Combination. Concepts and principles of Probability. Random variables. Probability and distribution Functions. Basic distributions: Bernoulli, Binomial, Hypergeometric, Poisson and Normal.

GST 115: INFORMATION AND COMMUNICATION TECHNOLOGY

Definition of ICT/Computers, development of modern ICT, hardware technology, software technology, Basic computer terms, features of a computer system, History of computer system, functional component of computer system. Communication and internet services, Binary number system, Application packages: Microsoft word, Excel, Power Point.

GST 111: COMMUNICATION IN ENGLISH

The course is designed to expose students to the rudiments of English language, as second language learners, to be able to communicate effectively in English language through the learning of Effective communication and writing skills. The course further exposes the students to the art of studying in the university. It teaches language skills, the skills for Writing of Essay answers and aims at teaching the students outline and paragraph development, collection and organization of materials and logical presentation of materials through the knowledge of research methods.

CHM 108 General Chemistry II (Practical) 1 Unit

CHM 102 General Chemistry II 2 Units

This course covers the structure of atoms, molecules, chemical equations in calculation, chemical reactions, chemical principles, periodicity, chemical bonding, chemistry of representative elements, nomenclature and classes of mass action, reactions, etc. The gas laws, kinetic theory of gases, the law of mass action, reaction rate, thermochemistry, chemical equilibrium, electrolyte and ionic equilibrium, theory of acids, bases and indicators, absorption chromatography etc.

PHY 108 General Physics II (Practical) 1 Unit

PHY 102 General Physics II 2 Units

The course covers mechanics, motion, heat, thermodynamics, waves, sound light, electricity & electronics power and energy, charge and capacitance; magnetism and magnetic properties of matter; and elements of circuit electronic and current circuits. Others are the structure of atoms, nucleus, stability of the nucleus, nuclear fusion, nuclear reaction, refraction mirror, prisms, lenses, electromagnetic spectrum, acoustics, and velocity.

BIO 108 General Biology II (Practical) 1 Unit

BIO 102 General Biology II 2 Units

Contents include characteristics, the structure of animal cells, heredity, principles of inheritance and evolution; general characteristics, structure, life patterns of the various phyla of the animal kingdom – amoeba, hydra taenia, Ascaris, fish, rabbit, amphibians, etc; reproduction in animals – mitosis & meiosis.

MAT 101: BASIC MATHEMATICS

(Prerequisite: O' Level Mathematics or equivalent) Elementary set theory, subsets, union, intersection, complements, Venn diagrams, real numbers; integers, rational and irrational numbers, mathematical induction, real sequences and series theory of quadratic equations, binomial theorem. Complex numbers; algebra of complex numbers; the Argand Diagram. De Moivre's theorem, nth. Roots of unity. Circular measure, trigonometric functions of angles of any magnitude, additions and factor formulae.

GST 114: NIGERIAN PEOPLE AND CULTURE

Study of Nigerian's history, culture and arts in pre-colonial times, Nigerian's perception of his world, culture areas of Nigeria and their characteristics, Evolution of Nigeria as a political unit, Indigene/settler phenomenon, Concepts of trade, economic self-reliance, Social Justice, Individual and national development, norms and values, Negative attitudes and conducts (cultism and related vices), re-orientation of moral and national values, Morals obligation of citizens, Environmental problems.

200 LEVEL COURSE DESCRIPTIONS

MLS 201: INTRODUCTION TO MEDICAL LABORATORY SCIENCE I

General introduction. Medical laboratory subjects: Clinical Chemistry, Haematology, Medical Microbiology, Histopathology and Immunology. Specimen Collection, Reception and Registration, Storage and Disposal. Specimen bottles, Safety precautions in pathology laboratory against chemical, biological, electrical materials and radiation hazards. Techniques and principles of chemical sterilization and physical methods. Glass cleaning, Laboratory location and floor plan.

MLS 202: INTRODUCTION TO MEDICAL LABORATORY SCIENCE II

Microscopy and micrometry use and care of microscopes. Registration and freeze-dry principles, uses, care and maintenance. Laboratory organization and management. Simple analytical techniques in chemical pathology. Presentation of volumetric analysis. Urinalysis, etc Principles of tissue preservation; fixation, processing and staining. Handling of surgical autopsy specimens. Removal of formalin pigment. Basic tool of the Microbiologist; wire loop, cotton wool, pipettes, swab and their uses; Preparation of films and basic staining techniques; Gram's stain, Ziehl Nelson's stain. Haematological stains; principle and components. Blood film preparations and staining. Pipettes, chambers, care and uses. Haemoglobin, PCV estimation, WBC counting.

ANA 201: GROSS ANATOMY I

(Upper limb, Thorax, Abdomen, Pelvis and Perineum) Upper limb/pectoral region, cubital fossa, carpal tunnel, hand, nerve injuries, shoulder, elbow and wrist joints. Osteology of the pectoral girdle and free limb bones. Vascular and nervous system, lymphatic drainage of the breast and upper limb. Thorax-intercoastal spaces, Mediastinum, Diaphragm, Abdomen, Osteology of the ribs and thoracic vertebrae; anterior abdominal wall and associated structures: rectum, prostate, Urinary bladder, Uterus. Pelvic floor, Blood vessels, Nerves and lymphatic drainage of the region, Osteology of the lumbar vertebrae

ANA 203: HISTOLOGY AND HISTOCHEMISTRY

General histology: the cell, epithelia, connective tissue, loose and special (cartilage, bone) Muscles-smooth, striated and cardiac; cardiovascular system: skin, gland of the skin, structure of the nails and hair. blood vessels and pleura. Bronchial tree. Gastrointestinal system: oral cavity, esophagus, stomach.

ANA 204: HISTOLOGY OF SPECIAL SENSES & NEUROHISTOLOGY

Neurohistology: Spinal cord, Brain stem, cerebrum and cerebellum. Organs of Special Senses: Sensory receptors, eyes, ear and nose. Histology of endocrine organs. Respiratory system. Digestive system. Urinary and genital systems. Electron micrograph studies of each organ.

ANA 208: GROSS ANATOMY II

(Lower limb, Head, Neck and CNS) Lower limb: gluteal region and femoral triangle: the thigh, leg and foot, hip, knee, ankle and medlaisal joints, Blood vessels, nerves and lymphatic drainage of the neck and parotid region. Nasal cavity, Oral cavity, pharynx, eye orbit, ear, Mechanism of hearing, smell, vision and taste, Osteology of bones of skull and cervical vertebrae, CNS-brain, cerebellum and cerebrum, cranial nerves

ANA 210: GENERAL BASIC EMBRYOLOGY

General consideration of the male and female reproductive organs. Gametogenesis, fertilization, implantation, cleavage, the morula, the blastocyst, formation of the primitive streak, the Bilaminar and Trilaminar germ disc. Development of tissues and organ systems of the embryo, the chorionic and amniotic cavities, foetal membranes, placental formations and functions. The molecular regulation in differentiation of tissues and organs in the establishment and patterning of the body axis. Birth defects, chromosomal and genetic factors. Twin and twin defects general characteristics of the embryonic and foetal periods.

PHS 201: GENERAL PRINCIPLES OF PHYSIOLOGY I

Introduction and history of physiology. Structure and functions of cell membranes. Transport processes. Biophysical principles. Homeostasis and control system, including temperature regulation. Blood: - functions of erythrocytes, leucocytes and thrombocytes. Haemopoiesis; Haemostasis. Blood groups. Renal Physiology: Definition and function of kidney, physiologic anatomy of the kidney, glomerular filtration, tubular function and urine formation: dilute and concentrated urine, counter mechanisms, plasma clearance, renal auto regulation.

PHS 208: GASTROINTESTINAL TRACT

Definitions and function, physiologic anatomy and innervations of GIT, digestion and food absorption, movement of GIT, GIT secretion and juices, liver and general metabolism.

PHS 209: GENERAL PRINCIPLE OF PHYSIOLOGY II

The heart: events of the cardiac cycle: cardiac output and control of cardiac contractility. The vessels: functional anatomy. Hemodynamic: Arterial blood pressure and its regulation, cardiovascular reflexes, peripheral resistance and local control of circulation. Regional blood flow: cardiovascular homeostasis in stress situations. Respiratory: Functions of upper respiratory tract. Mechanics of respiration including compliance, surfactant, lung volume and capacities: Pulmonary gas exchange. Blood gas transport. Pulmonary function tests: Nervous and chemical control of respiration. Response to hypoxia, high altitude and exercise; Artificial respiration. Membrane potentials, Nerve impulse and its physiological properties. Synaptic transmission. Mechanism of force production: functional adaptation of muscles. Functional organization of the CNS, autonomic neurotransmitter and autonomic effects.

PHS 210: ENDOCRINOLOGY AND REPRODUCTION

Definition of hormones, methods of Measurement, types and mechanism of action, regulation and physiology of hormones. Structures and functions of male and female reproductive organs, infertility in male and female, sexual cycle and hormonal regulation; family planning.

BCH 201: INTRODUCTION TO BIOCHEMISTRY

Chemistry of amino acids, protein and their derivatives; method of isolation and identification. Chemistry/structure of carbohydrates: Monosaccharides and disaccharides, polysaccharides and proteoglycans; Glycoproteins and glycolipids. Analysis of carbohydrate. A survey of biochemical catalysts, enzymes and coenzymes; their nature, properties, characteristics including enzyme kinetics. Method of isolation and identification of enzymes. Enzyme markers. Structures and functions of major cell components, prokaryotic versus eukaryotic organisms

BCH 202: CLINICAL BIOCHEMISTRY AND XENOBIOTIC

Dietary therapy in some disease state, use of enzymes in diagnosis. The biochemical basis of laboratory test of clinical significance. Molecular basis of in-born errors of metabolism. Xenobiotics and forensic biochemistry, blood biochemistry (including immunochemistry), biochemistry of vision.

BCH 203: PROTEIN CHEMISTRY AND ENZYMOLOGY

A review of the structural characteristic of proteins, determination of N and C terminal amino acid. Amino acid sequence and sulphide bridges. Determination of protein Structure by X- Crystallography. Biological functions of proteins. The oxygen transporting proteins (Haemoglobin and myoglobin) connective tissue protein. Collagen and elastin. Structure / function relationships. Enzymes. Isolation and purification from animals and plants. And microorganism. Zymogens and iso-enzymes. Characteristics of Enzymes. Kinetics of enzymes catalyzed reaction. All osterism. Importance of enzymology in medicine. Coenzymes and relationships to vitamins

BCH 204 BIOENERGETICS AND METABOLISM

An outline of biologic oxidations leading to intermediary metabolism of Carbohydrates. Lipids, Proteins amino acids nucleic acids and nucleotides. Electron transport and Oxidative Phosphorylations ATP and other high Energy compounds and their importance. Biochemical de-arrangement in G-6-PD deficiency. Sickle cell anaemia. Glycogen storage disease, etc. Illustrative laboratory exercises.

BCH 206: NUTRITIONAL BIOCHEMISTRY

Calorie proximate principles, Hydro soluble vitamins, liposoluble vitamins, major elements (macro minerals), trace elements (A micro minerals). Biochemical basis for assessing nutritional status.

BCH 210: GENERAL METHODS IN BIOCHEMISTRY

Practical laboratory exercise in areas of interest of academic staff to cut across a wide spectrum of general biochemistry. Laboratory practical may be arranged on a basis of 6 hours per week.

Principles of instrumentation. pH and pH meter, spectroscopy and spectrophotometry, centrifugation and isotopic techniques. Dialysis. Principles, methodologies and applications of electrophoresis, chromatography, thin-layer chromatography, spectroscopy and spectrophotometry, centrifugation and isotopic techniques. Dialysis.

MCB 201: GENERAL MICROBIOLOGY

History of Microbiology; Nature of microorganism; Structures and comparisons of prokaryotic and eukaryotic cells; Morphology, life cycles and economic importance of bacteria, viruses, fungi, protozoan, algae, lichen, bryophytes and pteridophytes; Principles of taxonomy with particular reference to bacteria; Nutrition of microorganisms; Physiology and microbial growth; Effects of environmental factors on growth of microorganisms; Mechanisms of metabolic and energy conversion in microbes. Introduction to food and industrial microbiology, environmental and petroleum microbiology. Soil and water microbiology, medical and veterinary microbiology.

BIO 204: BASIC BIOLOGICAL TECHNIQUES

Measuring techniques in cell fractionation, Chromatography, Spectrophotometry. Electrophoresis and colorimetry. Methods of studying the cell: Microscopy, Histochemistry and cytochemistry. Autoradiography Vs. Scintillation counting. Cell fractionation methods including differential centrifugation and Gradient centrifugation. Molecular hybridization including Paul Doty experiments. Acids and bases. Buffers and buffer systems. Henderson Haselbach equation. Titration curves of acids and bases, End-point indicators, Zwitterions isoelectric PH. Nucleic acid.

GST 201 PEACE STUDIES AND CONFLICTS RESOLUTION

Basic Concepts in peace studies and conflict resolution. Peace as vehicle of unity and development, Conflict issues, types of conflicts, e.g. Ethnic/religious/political/economic conflicts, Root causes of conflicts and violence in Africa, Indigene/settler phenomenon, peace- building, Management of conflict and security. Role of international organization in conflict resolution e.g. ECOWAS, African Union, United Nations etc.

GST 202: Environment and Sustainable Development

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. Pollution and Environmental effects of chemical plastics, Textiles, Wastes and other materials, Chemical and radiochemical hazards; Introduction to the various areas of science and technology; elements of environmental studies; nature of sustainable development; UN Sustainable development (SDG); and AU 2063 Agenda.

GST 212: ENTREPRENEURSHIP AND INNOVATION

Introduction of entrepreneurship and new venture creation; Entrepreneurship in theory and practice; The opportunity, form of business, staffing, marketing and the new venture, Determining capital requirements, Raising Capital; Financial planning and management; starting a new business, feasibility studies; Innovation; Legal Issues; Insurance and environmental considerations. Possible business opportunities in Nigeria.

300 LEVEL COURSE DESCRIPTIONS

MLS 301: LABORATORY POSTING

Posting of students to all sections of routine medical laboratories for on-the-job training under the supervision of qualified Medical Laboratory Scientists for 2 days weekly for the entire semester. Scored log books are kept by each student per posting.

MLS 302: LABORATORY POSTING II

Posting of students to all sections of routine medical laboratories for on-the-job training under the supervision of qualified Medical Laboratory Scientist for 2 days per week. Scored logbook records per bench are kept for each student per posting.

MLS 303: MEDICAL LABORATORY SCIENCE ETHICS

History and philosophy of ethics in the practice of medical laboratory science. Relationship between religion and socio-cultural values on medical ethics. Ethical issues involved in private practice. Relationship between the medical laboratory scientists and other members of the health team. Intra-professional auditing, medical laboratory science ethics and consultancy services. Element of informed concept in research. Relationship between proper dressing, personal comportment and patient care-the psychologist's view: Medical laboratory science ethics as it affect paternity dispute, infertility studies and sexually transmitted diseases, etc. Real case presentation, medico-legal aspects of medical laboratory practice.

MLS 304: LABORATORY INSTRUMENTATION & TECHNIQUES

Instrument aspects of qualitative and quantitative analysis- theory and practice of some common analytical techniques; colorimetry, spectrophotometry flame- photometry, conductometry, polarography, etc. Osmometry, nephelometry, turbidimetry, PH measurement by ion specific electrodes- separation techniques, including Electrophoresis: paper, cellulose, acetate, agar gel, starch and polyacrylamide gel; isoelectric focusing, isotophoresis, chromatography, ion exchange, gel filtration, molecular sieves; dialysis, filtration, solvent extraction, centrifugation- ultracentrifugation, immunoelectrophoretic techniques, radio immunoassay, competitive protein binding, isotope dilution techniques, Enzyme immunoassay, receptor Assay, automation, micro and ultra micro analysis. Practical based on the above topic.

MLS 305: GENERAL PATHOLOGY

Introduction to general pathology and common pathological terms, core aspect of pathology: etiology, pathogenesis, morphological changes. Functional derangement, signs& symptoms and clinical significance, Diagnostic tools/ techniques used in pathology, causes, course and outcomes of diseases. Cellular reaction to injury: cellular adaptation (Atrophy, Hypertrophy Hyperplasia, Aplasia, Metaplasia e.t.c., reversible and irreversible cellular injury, mechanisms of cellular injury. Inflammation: Definition, types, kind, cardinal signs, process, mechanism and inflammatory mediators Apoptosis and Necrosis. Fundamental of neoplasia/cancer cell formation, properties of cancer cells, Tissue repair mechanism. Genetic disorders. Review of common pathological conditions.

MLS 306: FUNDAMENTAL BLOOD GROUP SEROLOGY

ABO and Rhesus Blood Groups, Inheritance, distribution and Genetic Theory. Blood Grouping Techniques- principles, Disadvantages and Advantages, Preparation of Antisera, Antiserum titration avidity, potency and specificity. Plants lectins-preparation and standardization of antisera from lectins e.g. Dolochos biflorus. Anticoagulants used in BGS; ACD; CPD-CPA-A etc: modes of action and side effects. Blood bottles (MRC) and plastic Bags- Advantages and disadvantages. Donor screening-using CUSO₄ method- other methods of screening. Preparation of blood products- cryoprecipitate, platelet rich plasma, packed cells, fresh and frozen plasma, fibrinogen etc. Storage of blood and blood products- various methods, advantages and disadvantages. Blood banking- organization, structures, facilities and records. Blood group specific substance- synthesis, identification method(s) and application. Quality control of physical and chemical reagents. Practical/Tutorials. ABO and Rhesus grouping method Antiserum Titration DCT and ICT antibody screening.

MLS 307: BASIC IMMUNOLOGY

The historical background of immunology. Classification of immunity: Innate immunity. Development and structures of cells in the immune system. Cellular interaction in the expression and regulation of immunity acquired.

MLS 308: PUBLIC HEALTH MICROBIOLOGY

General principles of microbial disease transmission: waterborne, airborne, foodborne, arthropod-borne and contagious diseases. Principles and techniques for water treatment, waste water disposal. Preventive measures in the control of bacterial, parasitic and viral infections. Vaccines and immunizations. Immunization programme and schedule (EPI).

MLS 309: BASIC CLINICAL CHEMISTRY

Traditional and S.I units in clinical chemistry; reference values: Gastric function test; agents for gastric stimulation. Ward procedures and laboratory investigation of gastric sections: intestinal function tests; digestion and absorption; causes of malabsorption. Laboratory investigation of malabsorption. Renal functions of the kidney; measurement of renal plasma flow, glomerular filtration rate. Creatinine clearance, insulin clearance,

concentration and dilution tests; urinary acidification tests, Urine specific gravity/ Osmolarity. Dye Excretion test. Water and electrolyte status. Blood buffers. Transport of blood gases; assessment of acid/ base status. Lipids; Definition and types of lipids; Formation of free fatty acid, ketone bodies and lactate; measurement of plasma lipids and lipoprotein. Plasma proteins and physiology functions; factors affecting synthesis and catabolism. Methods for the determining of total protein in serum. Carbohydrate metabolism; Blood glucose homeostasis, hyperglycemia, diabetes mellitus- its cause and investigation; hypoglycemia-types, causes and investigation, Introduction to endocrinology.

MLS 310: LABORATORY MANGEMENT AND ORGANIZATION

Laboratory Management, planning of medical laboratory, including the provision for the reception of patients, selection and storage of chemicals, materials and apparatus. Detailed knowledge of the principles, use and maintenance of common laboratory apparatus and equipment. Ventilation, air conditioning and dust control in the laboratory. Equipment used in special workbench e.g cutting- up benches, media pouring, etc sterilization of air. Laboratory hazards and and safety measures to be taken in the use of radioactive and dangerous materials. Emergency treatment for accidents. Laboratory records: Maintenance of records: reception, recording, storage, filing and indexing of specimens and result. Organization and operation of a system of quality control. Cataloging and indexing of laboratory supplies. Methods of recording experiments. Laboratory Arts and Crafts: Elementary glass-blow; preparation of Pasteur pipettes, T-joints, bends, etc. Simple repair of broken glassware. Elementary knowledge of circuitry and circuit diagrams. Rectification of minor faults in electric circuits.

MLS 311: BASIC HAEMATOLOGY

Origin, development and function of blood cells. Synthesis and breakdown of haemoglobin. Methods of haemoglobin estimation. Methods of cell counting. Absolute values. Introduction to Homeostasis. Principles and mode of actions of common anticoagulants. Principle and components of Haematological stains. Simple tests used in blood coagulation. Blood films- normal and abnormal practical classes.

MLS 312: BASIC PARASITOLOGY

Introduction to parasitism and other animal association; adaptation to parasitic way of life. All parasites invade their hosts. The ineffective agents of parasites. Basic knowledge of structure, classification and life cycle of parasites of medical importance; vectors and intermediate host of parasites. Introduction to anthropods of medical importance. Biology of the mosquito in relation to the transmission of malaria, filariasis and viral infections.

MLS 313: BASIC HISTOPATHOLOGY

Introduction to histopathology: fixation, autolysis and bacterial decomposition. Effects of fixation: common fixing agents and their uses. Secondary fixation, post- fixation, post- chroming and post- mandating. Fixation pigments. Decalcification. Dehydration, clearing and

infiltration/embedding. Frozen and celloidin sections. Embedding media. Basic histology of organs. Principles and application of exfoliate Cytology. Collection and fixation of specimens for Cytological examinations. Museum technique- colour restoration. Mounting in museum jars.

MLS 314: MEDICAL PHYSICS

Kinematical and mathematical problems-circulation of pulse, blood pressure and volume changes. The heart and the blood surface tension effect. Temperature and heat flow/ electricity, electrocardiograms; general radiation, linear energy transfer and radiation measurement, radiation damage - detection and safety, x-ray generation and application radioisotopes production, use and disposal.

MLS 315: MEDICAL MICROBIOLOGY

History, Morphology, growth and nutrition. Classification and identification of bacteria. Bacteria genetics, bacteriophages, viruses, infection and resistance to infection. Sterilization and disinfection. Antimicrobial agents. Introduction to parasites and fungi.

MLS 316: SUPPLY CHAIN MANAGEMENT

Introduction to LMIS, SOP manual for facilities and staff in SCM, setting the context and introduction to supply management. Introduction to medical laboratory commodity procurement, monitoring and supervision, supply planning and shipment, selection, quantification for medical laboratory consumables, reagents and other health commodities, Assessing health logistics systems, storage and distribution of health commodities, adjusting pipeline in the Max-Min inventory control system,

PHM 301: INTRODUCTORY PHARMACOLOGY AND TOXICOLOGY I

Scope of pharmacology, Origin and sources of drugs, routes of administration of drugs, drug receptors and receptor isolation, Pharmacokinetics, absorption of drugs, excretion bio-transformation; Structure – activity relationship, Mode of action of drugs, Types of drug action, Drug action in man – compliance, individual variations, presence of other drugs, genetic effects, tolerance and tachyphylaxis, effects of diseases, drug toxicity, adverse drug reactions, Drug dependence and drug interactions. Drug in pregnancy and the extreme age.

PHM 301: INTRODUCTORY PHARMACOLOGY AND TOXICOLOGY II

Antimicrobial pharmacology, chemotherapeutic agents, antimetabolite base analogues, mitotic inhibitors, antibiotics, enzymes, alkylating agents and hormones. Radiation therapy. Synthesis and physiology of neurotransmitters. Biochemical basis of depression. Narcotics – mechanism of action. Fluorescent, radio and chromatic methods in drugs studies. Methods of evaluation of toxins, mutagens and carcinogens. LD50, ED50 and therapeutic index; introduction of new drugs, clinical trials; adverse drug reactions and adverse reaction surveillance.

400 LEVEL COURSE DESCRIPTIONS

MLS 401: LABORATORY POSTING III

Posting of students to all sections of routine medical laboratories for on-the-job training under the supervision of qualified Medical Laboratory Scientist for 2 days per week. Scored logbook records per bench are kept for each student per posting.

MLS 402: LABORATORY POSTING IV

Students are posted to the laboratory of their specialty for further practical experience in Laboratory Techniques Management for all disciplines under the supervision of Medical Laboratory Scientists. Students participate in all the routine activities of the laboratory for 2 days weekly for the entire semester, Scored log books are kept by each student per posting.

MLS 403: MEDICAL PARASITOLOGY AND ENTOMOLOGY

Introduction to parasites. Classification of Protozoa, (the amoebas, the ciliates, the flagellates, Nematodes. (Ascaris, Strongyloides, Trichuris, Guinea worms, Trichinella, Enterobius, etc.). Life cycle and Pathogenicity of Cestodes. (The tapeworms, larval forms of Cestodes). Life cycle and Pathogenicity of the Trematodes (The Schistosome, Fasciola paragonimus, etc). Methods of demonstration of parasites in the blood, faeces, vagina, urine, urethra; pus from lung and liver, skin snips, etc. Mechanism of their disease production; Epidemiology and control of parasitic diseases. Arthropods of medical importance- the crustaceans Arachnid Hexapoda, Myiasis, etc- their biology, life cycles and control. Life history as disease vectors; various diseases of medical importance transmissible by insects. Biology of mosquito in relation to transmission of malarial, filarial and viral infections etc.

MLS 404: BIOSTATICS

Aims, characteristics and application of biostatistics in biomedical sciences- samples, population variables, frequency distribution, vital and descriptive statistics, measurement of central tendencies – mean, median, mode, dispersion, standard deviation and coefficient of variation. Collection and presentation of data; probability distribution. Hypothetical tests of statistical significance. Analysis of variance, regression and correlation; experimental designs and clinical trials.

MLS 405: BASIC MEDICAL BACTERIOLOGY AND MYCOLOGY

Methods of the demonstration of bacterial forms and structure. Design and preparation of culture media. Sterilization and other methods of bacterial control. Aseptic procedures and methods for pure culture isolation; procedures for receiving, handling and processing of clinical specimens. Antibiotic assay, Sensitivity test and chemotherapy. Plate reading. Principle and techniques of anaerobic bacteriology. Methods of total and viable counts. Stock culture preservation, quality control of culture and media. Record-keeping in Bacteriology laboratory. Staining techniques for spores, capsules and negative staining procedure, wet preparation, motility tests. Introductory mycology.

MLS 406: VIROLOGY

Morphology and life cycle of viruses; nomenclature and classification of viruses – various methods. Reproduction and multiplication of viruses, resistance, pathology; collection of clinical specimens for viral culture. Culture methods for isolation of viruses, purification, immunity; laboratory diagnosis of viral infection. Haemoglobin test, CFT, Neutralization test, systematic study of viral diseases. Interferon, immunotherapy and chemotherapy in viral infections, inclusion bodies and cytopathic effects. Viral and host interactions and identifications, Viral vaccines and immunoprophylaxis.

MLS 407: RED CELL METABOLISM, HAEMOGLOBINOPATHY & MYELOPROLIFERATIONS

Iron metabolism, folate and Vit. B12 metabolism, Nomenclature, classification and investigation of common haemoglobinopathies; hemolytic anemia's; myeloproliferative disorder; homeostasis and disorder of homeostasis; investigation of bleeding disorders. Bone marrow. Practical classes.

MLS 408: HISTOPATHOLOGY TECHNIQUES AND MUSEUMS

Principle of photochemical methods. DNA- demonstration by Feulgen techniques. Silver impregnation methods. Genes and genetic code. Tissue culture techniques; chromosome analysis. Autoradiography – Definition and Principle. Organization of a medical museum. Method of colour maintenance. Fixation and storage of museum specimens. Special museum techniques eg Dawson's Method. Principle of photography-Macro and Microphotography. Preparation of stained sections for microphotography. Preparation of specimens for macro photography. Cytological normal cells. Histology of tissues. Atypical and malignant cells. Collection of cytological smears, processing and screening. Principles of general pathology. Systemic pathology: Gastrointestinal tract, Urinogenital, cutaneous. Principle of electron microscopy. Practical based on the topic.

MLS 409: BIOTECHNOLOGY AND BIOINFORMATICS

General preparation and storage of reagents for diagnostic use. Preparation and purification of antibody and antigen for diagnostic tools, Monoclonal and polyclonal antibodies. Concepts of vaccination. Preparation, purification and storage of vaccine. Introduction to Mathematical and Computational Genomics: Its application to medicine in general and laboratory diagnosis specifically.

MLS 410: BIOMEDICAL ENGINEERING

Workshop practice. Principles of use, maintenance and repairs of common apparatus and laboratory equipment. Principle of applied and general electronics. Circuit diagrams; computer programming. Improvisation. Glass blowing and construction of simple laboratory equipments. Design, techniques, improvement on existing equipment, review and modification of laboratory methods.

MLS 411: ANALYTICAL CHEMISTRY

Principles of analytical techniques in clinical chemistry-devising new techniques, biological trials and tests for acceptability. Solid/dry phase chemistry, dipstick technology, thin film technology immobilized enzymes – analytical techniques for qualitative and quantitative determination of enzymes, hormones, proteins, lipid, trace elements, non-protein nitrogen; Volumetric analysis – partition, adsorption, gel filtration, ion exchange and gas liquid chromatography. Electrochemical analysis – principles of potentiometric analysis. Fractionation of proteins-fractional precipitation (salting out), chromatographic and electrophoretic procedures. Protein precipitants-mode of action and choice in analytical procedures.

MLS 412: BLOOD GROUP SYSTEMS & COMPATIBILITY TESTS

Blood groups: - other blood groups e.g MNS, Duffy, Kell, Kidd, etc. Grouping techniques and antibody screening, clinical significance, serostatus. Antennal serology-Screening and Titration (quantitation) compatibility procedures-different methods, advantage and disadvantages, Blood Transfusion reactions – causes and types; investigation. Risks attendant in blood transfusion-Diseases; anaphylactic, hemolytic and allergic reactions. Screening of Donor blood for diseases. Compatibility procedures- advantages and disadvantages. Practical based on the above topics.

MLS 413: HUMAN CYTOLOGY

Collection, selection and preparation of cytology specimens (Cervical smear, Vaginal smear, Bronchial aspirates, Ascitic fluids and other fluids). Cytology: staining techniques, normal, atypical and malignant cells. Cornification index, progesterone/androgen effects.

MLS 414: COUNSELING SKILLS

Definition of counseling, care and support; types of counseling: pre-test. Post-test, prevention, primary or secondary, crisis management, problem solving, decision making, couple spiritual and pastoral, who needs counseling; prospect/benefits of counseling; constraints in counseling; rewarding listening skills, prevention and managing conflicts; genetic counseling, including sickle cell trait in marriage, blood donation campaign, HIV infection, etc. Case studies.

MLS 415: NUCLEIC ACID AND BIOCHEMISTRY

Nomenclature of bases, nucleosides and nucleotides. Nucleic acids. Hydrolysis of nucleic acids. Analysis of nucleotide sequence in nucleic acids and its application in diagnosis of diseases. Nucleic acid protein complexes. Genetic role, structure and replication of DNA. Introduction to polymerase chain reaction and its application in laboratory diagnosis.

MLS 416: IMMUNOLOGY/ IMMUNOCHEMISTRY

Immunoglobulin - Structure and infection. Gene organization and assembly. Mediators of cellular immunity. Phagocytic cell- Chemotaxis and effectors function of Macrophage and Granulocytes. The complement system. Laboratory methods of detection of antigens and antibodies. Autoimmunity;

Tissue and Graft reactions: Immune tolerance, self and non self Histo-compatibility, Transplantation; Tumor Immunology, Hypersensitivity and allergy.

NB: FOR 500 LEVEL THE SECOND DIGITS DENOTE SPECISLITY AREA AND THE THIRD DIGITS DENOTE THE TOPIC/STRESS AREA

MLS 501: LABORATORY POSTING V

Each student undergoes on the bench training in the different analytical techniques used in the area of specialization. The students are to participate in the routine operation of the laboratory. Each student under the supervision of a qualified medical laboratory scientist keeps lag books.

MLS 503: SEMINAR

Students are to carry out intensive literature research and present seminar on selected approved topics to a Departmental colloquium. Each presentation will be for 15-20 minutes followed by general discussion. A group of internal assessors appointed by the department will score the presentation.

MLS 505: RESEARCH METHODOLOGY

Introduction to research methodology. Collection of literature review articles. Problem definition. Sampling techniques. Experimental design of medical and data public health studies. Questionnaire designs and data collection and analysis. Interpretation and utilization of research findings. The role of research in health and social welfare. The need for institutional and governmental ethical clearance for some research. Aims, characteristics and application of biostatistics. Measures of central tendencies and variation. Collection and presentation of data. Probability sampling. Test of statistical, Significance. Experimental designs and clinical trials. Other applications of biostatistics to clinical and preventive medicine projects. Art of scholarly publications, and instructional design.

MLS 502: LABORATORY POSTING VI

Each student undergoes on the bench training in the different analytical techniques used in the area of specialization. The students are to participate in the routine operation of the laboratory. Lag books are kept by each student under the supervision of a qualified Medical Laboratory Scientist.

MLS 504: GENETICS AND MOLECULAR BIOLOGY

Genomic Gene purification and amplification, polymerase chain reaction technique. Construction of genetic maps. Biotechnology- recombinant DNA, hydridoma.

MLS 506: PROJECT

A supervised research project on an approved topic to be undertaken by each student for the partial fulfillment of the BMLS degree requirement. Assessment of the project will be by both oral defense and grading of the project content.

CHEMICAL PATHOLOGY SPECIALITY (CODE 010)

MLS 511: CARBOHYDRATE, PROTEIN AND LIPID METABOLISM

Carbohydrate metabolism and disorder. Pathophysiology of diabetes mellitus. Diabetic keto acidosis, Hyperomolar non- ketotic coma, lactic acidosis, glycogen storage disease. Insulinoma. Diagnostic criteria and laboratory investigation. Fasting plasma glucose, random plasma glucose, glucose tolerance test, pancreatic hormones and glycosylated haemoglobin. Lipid glycoproteins and apoprotein: Structure, composition and function. Intravascular metabolism and catabolism of lipoproteins. Disorders of lipids and lipoproteins. Lipid storage diseases. Cardiovascular function test, Myocardial infection, atherosclerosis etc. Research advance in diagnosis of lipid disorder. Plasma proteins in health and diseases. Definition, causes and investigation of paraprotein; Bence Jones proteinuria and significance. Protein electrophoresis in health and diseases. Protein degradation. Metabolic disorder and regulation of amino acid metabolism.

MLS 512: DRUG MONITORING, TOXICOLOGY AND INBORN ERROR OF METABOLISM

Introduction to assimilation, distribution, elimination and excretion of drugs. Practical and theoretical aspect of poisoning. Investigation of suspected cases of poisoning. Estimation of blood alcohol, salicylate, sulphonamide, cyanide, oxygen, CO₂, ammonia and detection of barbiturate, cocaine, heroin, opium, phenothiazine, methaqualone, etc in blood, urine, sweat, aspirates, etc. Phorphyrin: causes, symptoms and laboratory investigation of porphyrinaemia, porphyria and porhyrinuria. Haemoglobin, synthesis, chemistry of haemoglobinopathies, SulpHb, CoHb, MetHb. Definition, causes, consequence and investigation of some inborn, errors of metabolism; Phenylketonuria, galactosemia, fructose intolerance, Albinism, amino aciduria.

MLS 513: CLINICAL RENAL, LIVER & NEUROCHEMISTRY

Physiology of kidney, renal clearance & glomerular filtration rate. Renal plasma fluid, maximal tubular respiratory and reabsorptive capacity. Urea, creatinine and insulin clearance. Concentration and dilution tests. Renal failure, azotaemia, anurea, sodium loss in renal disease. Aminoaciduria. Kidney diseases and kidney function tests. Urinalysis in health and diseases. Features of hypernatraemia and hyponatraemia. Investigation of water and electrolyte imbalance. Homeostasis in clinical chemistry. Acid-base balance. The liver anatomy and physiology- an overview. Biosynthesis of bilirubin; excretion of bile pigment. Jaundice: anatomical and physiological classification. Pigment excretion in jaundice. Liver disease and liver functions: test to include Congo red test of amyloisis and faecal fat estimation. Biochemistry of Neoplastic disorders. Diseases of the nervous system. Basic neurochemistry, CSF- normal composition and change in diseases. Diseases of the muscles.

MLS 514: CLINICAL AND REPRODUCTIVE ENDOCRINOLOGY

Endocrine glands-organization. Cellular communication by endocrine glands. Endocrine receptor, binding control of endocrine action. Endocrine glands:

functions:- the hypothalamus, the pituitary, the parathyroid, adrenal cortex, adrenal medulla, the gonads and reproductive endocrinology. Foeto-placental function. Endocrine control of metabolism and endocrine diseases/disorder; water balance, insulin action, thyroid hormones and reproduction. Investigation of male and female infertility.

MLS 515: ENZYMOLOGY

Mechanism of enzyme actions and kinetics, activation repression phenomenon. Enzyme induction, inhibition, purification and specificity. Clinical enzymology; coenzyme and isoenzyme in medicine; diagnosis; importance of isoenzymes in biotechnology.

MLS 516: TECHNIQUES IN CLINICAL CHEMISTRY

Analytical techniques: standardization and quality control. Validation of assay. Birth of a new method, devising new techniques. Biological trial and test for acceptability. Solid/dry phase chemistry. Dipstick technology, thin film technology. Immobilized enzymes. Functional test in clinical chemistry. Liver function test. Renal function test. Gastro-intestinal function test etc. Analytical techniques employed in qualitative and quantitative, determination of (1) enzymes phosphate. Transaminases, Dehydrogenases, kinases. (2) Hormones (3) Protein-total proteins, Albumin and globulin, specific protein; (4) Lipids-cholesterol, triglycerides glycerol, fatty acids and lipoproteins.(5) Trace element-Fe, Cu, Zn, Mg, Selenium, (6) Non-protein nitrogen- urea, creatinine, uric acid, amino acids and ammonia. Urinalysis: determination of urine specific gravity, osmolarity; qualitative tests for protein, glucose and reducing substances. Ketone bodies, bilirubin, urobilinogen and blood. Haemoglobin and haemoglobin derivative in urine. Spectroscopy of haemoglobin and derivative in blood and urine. Astrup techniques. Chromatography, spectroscopy, spectrophotometry and photometry, AAS, flame photometer, (AES), Radioimmunoassay, ELISA and EIA, Electrophoresis.

MLS 517: NUTRITION, CLINICAL VITAMINOLOGY AND TRACE ELEMENTS

Vitamins: history and biochemical functions. Chemical and metabolism of water and fats soluble vitamins. Their deficiency state and physiological significance. Relationship with hormones. Vitamins in health and diseases. Method of analysis. Trace element- bioavailability, biochemical function, metabolism and interaction. Hormonal control and methods of analysis. Specific element in health and diseases. Bone diseases and investigation of bone disorders. Types, causes. Causes and investigation of nutritional disorders. Trace Element and essential trace elements in health and disease, Laboratory assessment of trace elements, toxicity and deficiency.

HAEMATOLOGY & BLOOD TRANSFUSION SCIENCES SPECIALITY (CODE 020)

MLS 507: HUMAN CYTOGENETICS

Theory and practice of clinical cytogenetics. Chromosome analysis, structure, organization and staining techniques. Chromosomes in man: Normal

karyotype and chromosome abnormalities. Mosaicism, trisomy, monosomy, translocation, Klinefelter's and Turner's syndromes, sex chromatin. Inactivation of X-chromosome and sex determination. Genetic diseases. Clones, mapping of autosomes, DNA synthesis, gene inheritance. X-linked inheritance. Chimeras. Genes in families and population. Selection, pedigree analysis, mutations and mutagens, Hardy-Weinberg equation, gene drift, inbreed. Slide reporting. Philadelphia and Christ-church chromosomes.

MLS 521: HAEMOPOIESIS, HAEMOGLOBIN, HAEMOGLOBINOPATHIES & MYELOPROLIFERATIONS

Erythropoiesis and blood. Blood cell counts in health and diseases. Blood indices. Anaemias, disorders of iron metabolism, vitamin B12 and Folate deficiencies, Haemochromatosis and related storage disorders. The spleen and splenomegaly syndromes. Drugs, chemical and the blood Haemoglobinopathies, Haemoglobin genotype and phenotype.

Blood in infancy, child and pregnancy, Hereditary and blood disorders. Blood in microbial infections. Identification of blood parasites. Immunohaematological disorders, autoimmune diseases, thrombocytopenia, leucopenia, Leukemia; systemic and disseminated lupus erythematosus, rheumatoid arthritis, myelomatosis and other paraproteinaemias. Preparation and cytology of blood and bone marrow films in health and disease.

MLS 522: ADVANCE BLOOD GROUP SEROLOGY TECHNIQUES

Techniques for emergency compatibility testing- low ionic sucrose solution spin Coomb's albumin special compatibility techniques. Exchange and extracorporeal blood transfusion. Preparation of enzymes used in BGS. Forensic application of BGS; Two-stage Coomb's technique. Automation in BGS- Group and Cross matching. Techniques, autoanalysers for antibodies and antigen detection and identification, etc.

MLS 523: BLOOD GROUP SYSTEMS AND COMPATIBILITY TESTS

ABO and other blood groups- MNS, KELL, Kidd, Duffy, Lewis, p-1 etc. Antenatal serology; Hemolytic diseases of the newborn. Type, etiology, antenatal and post-natal management. Blood group serology in paternity dispute. Haemolysin titration, Absorption and elution techniques. Indication and complication of blood transfusion. Red cell survival tests-radioisotope and differential agglutination methods. Screening of blood donor for infective agent like HIV, HBV, malaria, filarial, trypanosomes, syphilis, etc, anonymous result in blood grouping. False positive and false negative result in compatibility testing. Preparation and standardization of AHG.

MLS 524: COAGULATION AND FIBRINOLYSIS

Platelet functions, normal and abnormal haemostasis, measurement of bleeding time. Vascular integrity. Coagulation factors, assessment of coagulation time. One stage prothrombin time, Thrombotest thromboplastin generation. Haemophilia state, assay of anti-haemophilic factor (viii),

recalification time. Fibrinolytic activities rapid demonstration of fibrinogen deficiency Simple assessment of fibrinolysis. General Principles underlying clotting factors assay and measurement of fibrolytic activity. Platelet substitute solution. Fibrin plates. Control of anticoagulant therapy.

MLS 525: SEROLOGY AND BLOOD TRANSFUSION SCIENCE

Leucocytes and platelets, antigen and antibody. Anti-immunization IgM, IgG, IgA antibodies. National board transfusion service. Preparation of commercial quantities of polyclonal antisera. Principles, uses and techniques of producing monoclonal and polyclonal antibodies. Type of blood substitutes and preservations. Preparation of blood products. WHO standards in BGS. Red cell membrane structure in relation to blood antigen locations.

MLS 526: ADVANCED HAEMATOLOGY TECHNIQUE

Principles and techniques of isoelectric focusing. Protein separation and column chromatography. Finger - printing; principles and techniques. Purification of proteins and enzymes. Ultracentrifugation and molecular weight determination. Culture of blood cells and parasite. Leukocyte typing, platelet aggregation - principles and techniques. Radioisotopes in haematolgy; Isotope labeling techniques, measurement of radioactivity. Flourescent antibody techniques. Radioimmunoassay, ELIZA, western blotting immune - electrophoresis. Competitive protein binding. Automation in haematology. Electrophoresis- starch, agar, gel and polyacrilamide gel. Principle of polymerase chain reaction. Cytochemical procedures. Lymphocyte transformation tests. Paul - Bunnel test.

HISTOPATHOLOGY SPECIALITY (CODE 030)

MLS 507: HUMAN CYTOGENETIC

Theory and practice of clinical cytogenetics. Chromosomes analysis, structure, organization, and staining technique. Chromosomes in man. Normal karyotype and chromosome abnormalities. Mosaicism, trisomy, monosomy, translocation, klinefelters and tuners syndromes, sex chromatins. Inactivation of X-chromosome and sex determination Genetic diseases. Clones, mapping of autosomes, DNA synthesis, gene kindred segregation. X-linked inheritance. Chimeras Genes in families population. Selection, pedigree analysis, putation and mutagens. HardWeinberg equation, genetic drift, Inbreed. Slide reporting. Philadelphia and Christ church chromosomes.

MLS 531: FUNDAMENTAL HISTOCHEMISTRY

Theory and methodology of histochemistry; chromaffin tissues. Schmol's Diazo and other histochemical techniques. Enzymes highlighted. Cytology of normal cells, Epithelial cells and tissues atypical and malignant cells. Gynae-Cytology. Hormonal evaluation. Cells and other constituents, sputum, effusions, Urine and other fluids cytology. Stains-theory and application of staining, metallic impregnation and histochemical methods. Properties of natural and synthetic dyes. Composition, preparation and storage of staining reagents. Testing of reagents. The dye theory. Common nuclear stains and

counter stains for general tissue structure. Methods to demonstrate connective tissues and fibres.

MLS 532: EXFOLIATIVE CYTOLOGY

Introduction to exfoliative cytology. Definitions and principle of exfoliative cytological methods. Diagnostic criteria for all malignancy. Kinds of tumours. Sampling. Fixation and staining techniques in clinical cytology. Gynaecology. Hormonal evaluation. Cells and other constituents in sputum effusions. CSF, urine and other fluids. Slide reporting.

MLS 533: SYSTEMIC HISTOPATHOLOGY

This course exposes the students more in general pathology, control of result and management of histopathology laboratory. More facts of electron microscopy and autoradiograph are highlighted. Principles of general pathology applied to individual organs. Systemic pathology. Hypertensive heart disease, heart failure and cardiomyopathies. Respiratory- tuberculosis, pneumonia. Nephropathy associated with infestations and infections. CNS, special senses. Malignant lymphomas (non- Hodgkins and Hodgkins lymphomas, burkitts). Idiopathic- tropical splenomegaly syndrome. Liver-cirrhosis, liver cell carcinoma. Hepatitis. Female reproductive organs- pelvic inflammatory diseases. Cancer-cervical, trophoblast, ovarian. Skin leprosy, kaposi sarcoma. Electron microscopy-preparation of materials for electron microscopy. Toxicity of some reagents used in Electron microscopy. Techniques involved in autoradiography, laboratory management. Quality control and automation in histopathology laboratory. Slide reporting.

MLS 534: HISTOPATHOLOGY TECHNIQUES/EMBALMMENT

Fluorescence micro techniques. Autoradiography-principles and techniques. Ultramicrotomy, microincineration; principles of photography-micro and macro photography, preparation of stained smears and specimen for micro photography and macro photography respectively. Electron microscopy: preparation of materials and embedding reagents used. Toxicity of some reagents used in electron in microscopy. Embalming fluids and embalmment techniques & demonstration. Automation in Histopathology.

MLS 535: FUNDAMENTAL HISTOPATHOLOGY

Fixation; Purpose and effect of fixative, composition and uses of fixatives and their respective action on tissue components. Microscopic appearance of tissue after various methods of fixation. Function and scope of secondary fixation, post – fixation and post- mordanting. Knowledge of fixation of tissue for histochemical method to include freeze –drying substitute. Decalcification- processing techniques- paraffin wax, embedding media for mechanical and manual processing. Microtomy- microtomes (manipulation and uses of rocking, rotary, sledge, freezing cryostat and ultra microtomes), knives- selection and maintenance for various microtomes, manual and mechanical sharpening. Section cutting technicals used with different embedding media, attachment of sections to slides- frozen section techniques, methods for rapid diagnosis.

MLS 536: MUSEUM TECHNIQUES

Preparation and museum mounting of specimens. Techniques of museum display. Organization of medical museums. Methods of colour maintenance. Fixation and storage of museum specimens. Special museum techniques.

MEDICAL MICROBIOLOGY SPECIALITY (CODE 040)

MLS 541: SYSTEMATIC BACTERIOLOGY

History of pathogenic microbiology. Normal body flora, Pathogens. Sources of infection, Laboratory diagnosis and identification of bacteria. The pyogenic cocci, (Staphi, Strep, Pneumococci & Neirsseriae). The enterobacteriaceae, coli forms, gastroenteritis, Salmonellosis, Shigellosis, Cholera-vibrios, Pseudomonas, Bacteriodes, etc. The Haemophilic bacillus (haemo-philus, Brucellae, Yersinia, Bordetella etc. Anaerobic spore formers, Aerobic spore formers. (Bacillus, Clostridia, Spirochetes, Mycobacterium), Rickettsiae, Chlamydiae, Mycoplasma, L- forms, Listeria, Erysipelothrix, Bartonella, etc. General pathology, epidermiology: features, diagnosis, control and therapy; anaerobiosis.

MLS 542: MEDICAL VIROLOGY

The dermatropic and viscerotropic viruses. Smallpox, cowpox and vaccination; measles, rubella, chicken pox and shingles, Herpes viruses, yellow fever, laser fever, Hepatitis A, B and C, influenza, arboviruse. The neurotropic viruses (rabies, poliomyelitis, encephalitis, Lymphocytic Choriomeningtis viruses, mumps, viral transformation and types of tumors and viruses. Oncogen theory etc. Viral gastroenteritis; Miscellaneous viruses, vaccines, production and immunization.

MLS 543: ADVANCED MEDICAL PARASITOLOGY AND EPIDEMIOLOGY

Biology of parasites knowledge of the structure, classification and life cycles of all protozoa and helminthes of medical importance and their intermediate hosts and vectors. Arthropods and other vectors of important diseases of man. The following parasites of animals: trypanosome, lewisi, eimeriidae, fasciola hepatica, Dipylidium caninum, larval forms of Taenia, E. granulosus, Hydatid diseases. A more detailed knowledge of the following associated disease in man. Protozoa and Protozoa infections

Morphology, physiology, life cycles and classification class: Trematoda super families Schistomatoida fascioloidea Ospisthochoiidea Troglotrematoidea Class: Nematoda super families Acaridoidea, Oxyyuroidea Rhabdtoidea. Trichnelloidea, Strongyloidea and Filariodea Morphology.

MLS 544: PHARMACEUTICAL AND MICROBIOLOGY AND MICROBIAL GENETICS

Principles of antibiotics and chemotheraphy. Mode of bacteria resistance to antibiotics. Sensitive testing. Preparation of antibiogram disks. Minimum inhibitory concentration of antibiotics. History of antibiotics, mode of action, classification, antibiotic assay, use of animal mode in the study of microbial infection. Evolution and inheritance mutation. Bacteria DNA in hereditary and mutation. Molecular basis of mutation, isolation of mutants,

bacteriophages, plasmids, episomes, transposons and bacterial DNA transfers. Recombinant DNA technology and its applications.

MLS 545: ADVANCED ENTOMOLOGY

Structure and classification of arthropods of medical importance. Diptherial:- Families- Culicidea, Psychodidae, Sunuliidae, Ceratopogonidae, Tabanidae, Muscidae, Calliophoridae, Oestridae, Hemiptera: Families - Cimicidae, Reduviidae Anoplura: Family - Pediculidae Siphonaptera: Families- Pubicidae, Ceratophillidae, Leptosylliae, tungidae Acarina:- Families- Ixodidae, Argasudae, Trombiculidae, Sarcoptidae, Demodicidae, Dermanyssidae, Poroceohalidae, Liunguatulidae. Special Topics The epidemiology and geographical distribution of human diseases. Larval migrants. Group Spirochaetacea. Immune reactions (serology).

MLS 546: LABORATORY TECHNIQUES IN MICROBIOLOGY

Culture media (Different types, compounding from basic constituent and preparation of medias). Examination, cultivation and identification of bacteria from different samples, pleural CSF, urine, sputum, ascitic fluid. Blood culture, High vaginal swab, wound swab, ear, eye, nasal and other swabs. Stool bacteriology. Sputum bacteriology. Urine bacteriology. Systemic fungal culture and identification. Semen analysis. Special serological test. ASO, Widal, VDRL, Rheumatoid factor. Complement fixation, neutralization haemagglutination tests for identification of microorganism. General identification of microorganisms by animal inoculation. Biochemical test for identification of bacteria and fungi.

MLS 547: MEDICAL MYCOLOGY

General characteristics of fungal diseases, types of mycoses and properties; opportunistic fungi: Diagnosis and chemotherapy, Systemic mycosis (Cryptococcosis, Blastomycose, Histoplasmosis, Coccidiomycoses). Opportunistic: mycoses (Candidaeasis, Phycomycosis; Sporotrichosis, Chromoblastomycosis, etc). Cutaneous mycosis- Dermatophytosis. Superficial mycosis. General properties, pathogenesis, diagnosis, epidemiology, control and recognitions of fungi.