

# MAND COURSE. FOR NATIONAL DIPLOMA (NO) MEDICAL LABORATORY TECHNOLOGY AND THE CHILD AND THE CHILD

#### **FOREWORD**

Medical science is advancing rapidly and the role of medical laboratory technicians has become increasingly vital. From the detection of infectious diseases to the monitoring of chronic conditions and the evaluation of genetic markers, the accuracy and reliability of laboratory results are crucial for effective medical interventions.

I believe that this curriculum and course specifications which are the minimum required to produce technicians with sound knowledge and skills in medical laboratory technology, if properly implemented with the required resources (qualified teaching staff and adequate equipment/consumables, physical training facilities, and teaching aids), also with qualified candidates admitted into the programme, will lead to the production of competent and skilled workforce required in the sector.

I wish to express my deep appreciation to those that made the development of the curriculum possible. The invaluable contributions of all the members of the Team and resource persons during the idea generation, pre-critique, and critique workshops are appreciated.

I hope that the curriculum will be properly implemented, to produce the required manpower for better service delivery in the health sector in Nigeria.

Prof. Idris M. Bugaje,
EXECUTIVE SECRETARY,
NBTE KADUNA.

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#### **GENERAL INFORMATION**

1.0 PROGRAMME NOMENCLATURE

National Diploma (ND) Medical Laboratory Technology

#### 2.0 PROGRAMME GOAL

The goal of this curriculum is to train competent medical laboratory technicians to meet present and projected service needs in primary and secondary health care services in Nigeria.

#### 3.0 OBJECTIVES OF THE PROGRAMME

The objectives of the programme on completion are to:

- i. Perform routine Medical Microbiology, Histopathology and Cytology, Haematology and Blood Group Serology, Chemical Pathology, Medical Parasitology, Immunology and Virology tests under the supervision of a Medical Laboratory Scientist
- ii. Carry out first Aid Care in the Medical Laborator
- iii. Assist a Medical Laboratory Scientist in the management and organisation of a Medical Laboratory.
- iv. Collect, Collate, Process and enter accurately medical laboratory data using the Medical Laboratory Information Management system
- v. Prepare reagents and chemicals used for medical laboratory diagnosis.
- vi. Perform basic equipment maintenance in a medical laboratory.
- vii. Carry out and present research outcomes logically.
- viii. Collect and process samples for medical laboratory investigations.
- ix. Collect, process, manage, and dispose of medical laboratory waste.
- x. Identify basic Arthropods causing ill-health.
- xi. Recognize and adhere to safety policies and practices

#### 4.0 ENTRY REQUIREMENTS

- i. At least a minimum score in the Unified Tertiary Matriculation Examination (UTMR) as stipulated by JAMB
- ii. A minimum of five (5) credit passes at Senior Secondary School Certificate and other approved equivalent O-Level Certificates (NECO, NABTEB or WASC/GCE) in the following subjects: English, Mathematics, Chemistry, Biology and Physics at not more than two sittings.

## 5.0 STRUCTURE/DURATION OF THE PROGRAMME

The ND Medical Laboratory Technology programme is structured for two years of four (4) semesters of classroom work, laboratory posting and field work in accredited health facilities.

The duration also incorporates 3-4 months Supervised Industrial Field Experience (SUPFE) which shall take place at the end of the second semester of the first year for not less than 3-4 months.

Each semester shall be for 15-17 weeks, made up of as follows:

- 15 contact weeks of teaching (i.e. lectures and practical sessions etc.) and
- 2 weeks for registration, tests, quizzes and examinations

#### 6.0 CURRICULUM

The Curriculum of the ND Medical Laboratory Technology programme consists of four (4) main components. These are:

1. General Studies/General Education Courses components shall include courses in English Language and Communication, Literacy, Societal Knowledge or History, Citizenship Education, Computer Knowledge and Entrepreneurship which are mandatory, others include General Sciences. These are compulsory and constitute 15% of total contact hours.

- 2. **Foundation Courses** include courses in Mathematics, Pure sciences, and those introductory components courses that are offered in the core Department for the purposes of rudimentary knowledge or background, etc. These courses should constitute a maximum of 25% of the total contact hours for the programme
- 3. **Professional Courses** are courses, which give the student the theory and practical skills in Medical Laboratory Technology which he or she needs to practice. These should account for a maximum of 65% of the contact hours of the programme
- 4. **Supervised Field Experience (SIWES)** Supervised Industrial Work Experience Scheme (SIWES) shall be taken during the long vacation following the end of the second semester of the first year. See details on SIWES below.

#### 7.0 ASSESSMENT CRITERIA

Aspect	Classwork/Practical	Semester	Total
	and Laboratory	Examination	
	Works		
Theory	10	30	40
Practical	20	40	60
Total	30	70	100

#### 8.0 CONDITIONS FOR THE AWARD OF NATIONAL DIPLOMA

For the programme to qualify for the award of National Diploma (ND), programme, it should have been accredited by the National Board for Technical Education, (NBTE) Kaduna

The conditions for the award of National Diploma for Medical Laboratory Technology Certificate include the following:

1. Satisfactory performance in all prescribed coursework/assignments, tests/quizzes, workshop practice, laboratory work, field trips etc.

- 2. Satisfactory completion of Supervised Field Experience (SIWES)
- 3. Satisfactory performance in all semester examinations
- 4. Satisfactory completion of written term papers and or final year diploma project works
- 5. The candidate should have completed a minimum of 103 and maximum of 110 total credit units.

Additionally, candidate must pass the professional certification examination administered by the Medical Laboratory Science Council of Nigeria (MLSCN) in the second semester of the second year of ND programme. This will enable the Council to induct the students for certification to practice as Medical Laboratory Technicians. The professional certification examination shall involve the following examination

- Oral examination
- Practical examination
- Theory examination

The National Diploma shall be awarded based on the following classification

Class of Diploma	CGPA Q
Distinction	3.50 - 4.00
Upper Credit	3.00 - 3.49
Lower Credit	2.50 2.99
Pass	2.00 - 2.49

#### 9.0 ACCREDITATION OF THE PROGRAMME

The ND programme shall be accredited by the NBTE and the MLSCN before Diplomates can be awarded.

# 10.0 LOGBOOK

There shall be two types of logbooks

- A personal logbook for each course to be taken is to be kept by the students. It shall contain all the recordings of the day-to-day, weekly and semester practical works/activities from day 1 to the end of the programme. This is to be checked, marked appropriately and endorsed by all lecturers concerned at the end of every week
- An end-of-school (post diploma) log book maintained by a Supervisee medical laboratory scientist for the entry of their daily/weekly Field Experience work in the Medical Laboratory Technology Department/Unit of Supervisee's posting. The log book shall be duly signed by the industry-based-Supervisor on monthly basis. At the end of the MLSCN supervised 52-week long SUPFE, the Supervisee receives a certificate of SUPFE completion from MLSCN

#### 11.0 FINAL YEAR PROJECTS

Final year students of the ND programme are expected to carry out a project work, which should be on individual or group basis. The project should as much as possible be something that is implementable or marketable. Project reports should be properly supervised and well presented. The Departments offering the programme should make its own arrangement of schedules for project work

# 12.0 GUIDANCE NOTES FOR TEACHERS TEACHING THE PROGRAMME

The new curriculum is drawn in course units. This is in keeping with the provisions of the National Policy on Education which stresses the need to introduce the semester credit units which will enable a student who so wishes to transfer the units already completed in an institution of similar standard from which he/she is transferring. In designing the units, the principle of the modular system by product has been adopted; thus making each of the professional modules, when completed provide the student with technical skills, which can be used for employment purposes.

As the success of the credit unit system depends on the articulation of the programme between the institution and industry, the curriculum content has been written in behavioural objectives, so that it is clear to all stakeholders what the diplomats of the programme have learnt. There is a slight departure in the presentation of the performance-based curriculum which requires the conditions under which the performance are expected to be carried out and the criteria for the acceptable levels of performance. It is a deliberate attempt to further involve the staff of the department teaching the programme to write their

own curriculum stating the conditions under which the performance can take place and to follow that with the criteria for determining an acceptable level of performance.

Departmental submission on the final curriculum should be approved by the Academic Board of the institution.

Our aim is to continue to see to it that a solid internal evaluation system exists in each institution for ensuring minimum standard and quality of education in the programmes offered throughout the polytechnic system.

The teaching of the theory and practical work should, as much as possible, be integrated. Practical exercises, especially those in professional courses and laboratory work, should not be taught in isolation from the theory. For each course, there should be a balance of theory to practice in the ratio of at least 60:40.

Normally, continuous assessment should be 40% while semester examination should be 60% to make a total of 100%.

#### 13.0 GUIDELINES ON SIWES PROGRAMME

For the smooth operation of the SIWES the following guidelines shall apply:

# **GRADING OF SIWES**

To ensure uniformity of grading scales, the institution should ensure that the uniform grading of students" work, which has been agreed to by all Polytechnics and similar NR awarding Institutions, is adopted.

# The Institution Based Supervisor

The institution-based supervisor should initial the log book during each visit. This will enable him to check and determine to what extent the objectives of the scheme are being met and to assist students having any problems regarding the specific assignments given to them by their industry-based supervisor.

# **Frequency of Visit**

Institution should ensure that students placed on attachment are visited within one month of their placement. Other visits shall be arranged so that:

- i) There is another visit six weeks after the first visit; and
- ii) a final visit in the last month of the attachment.

# **Responsibility for Placement of Students**

- a) Institution offering the ND programme shall arrange to place the students in industry. By the end of second semester the first academic session, six copies of the master list showing where each student has been placed shall be submitted to the Executive Secretary, NBTE who shall, in turn, authenticate the list and forward it to the Industrial Training Fund, Jos.
- b) The Placement Officer should discuss and agree with industry on the following:
  - i. a task inventory of what the students should be expected to experience during the period of attachment. It may be wise to adopt the one already approved for each field.
  - ii. the industry-based supervisor of the student during the period, likewise the institution-based supervisor.
  - iii. the final grading of the student during the period of attachment should be weighted more on the evaluation by his industry-based supervisor.

# **Evaluation of Students during the SIWES**

In the evaluation of the student, cognizance should be taken of the following items: a) Punctuality

- b) Attendance
- c) General Attitude to Work

- d) Respect for Authority
- e) Interest in the field/technical area
- f) Technical competence as a potential technician in the field.

# **Stipend for Students in SIWES**

The rate of stipend payable shall be determined from time to time by the Federal Government after due consultation with the Federal Ministry of Education, the Industrial Training Fund and NBTE.

# SIWES as a Component of the Curriculum

The completion of SIWES is important in the final determination of whether the student is successful in the programme or not. Failure in the SIWES is an indication that the student has not shown sufficient interest in the field or has no potential to become a skilled technician in the field. The SIWES should be graded on a fail or pass basis. Where a student has satisfied all other requirements but failed SIWES, he or she may only be allowed to repeat another four months SIWES at his own expense.

# YEAR I SEMESTER I

COURSE	COURSE TITTLE	L	P	CU	СН
CODE			39		
MLT 111	Introduction to Medical Laboratory Science I	3	-	3	3
MLT 112	History and Philosophy of Science	2	-	2	2
MLT 113	General Mathematics I	<u> </u>	-	2	2
GNS 214	General Physics I	2	1	3	3
GNS 229	General Chemistry I	2	1	3	3
GNS 230	General Biology I	2	1	3	3
EHT 111	Introduction to Environmental Health	2	1	3	3
GNS 111	Citizenship Education I	2	-	2	2
COM 111	Introduction to Computing	2	1	3	3
GNS 102	Communication in English I	2	-	2	2
TOTAL		21	5	26	26

# YEAR I SEMESTER II

COURSE	COURSE TITTLE	L	P	CU	СН
CODE		Y			
MLT 121	Introduction to Medical Laboratory Science II	2	-	2	2
MLT 122	First Aid and Primary Healthcare	2	-	2	2
MLT 123	Philosophy, Logic and Critical Reasoning	2	-	2	2
MLT 124	Introduction to Medical Laboratory Information	1	2	3	3
	Management System (MLIMS)				
MLT 125	Medical Laboratory Techniques	2	1	3	3
MLT 126	Introduction to Medical Laboratory Management,	2	-	2	2
	Organization & Ethics I				
MLT 127	General Mathematics II	2	-	2	2
GNS 324	General Chemistry II	2	1	3	3
GNS 314	General Physics II	2	1	3	3
GNS 325	General Biology II	2	1	3	3
GNS 202	Communication in English II	2	-	2	2
ENT 126	Introduction to Entrepreneurship I	2	-	2	2
MSQ	Mandatory Skills Qualification	-	-	-	2
MLT 128	Clinical Laboratory Posting (SIWES)	-	-	-	-
TOTAL		23	6	29	31

# YEAR II SEMESTER I

COURSE	COURSE TITLE	L	P	CU	СН
CODE					
			10,		
MLT 211	Medical Microbiology I	2	Vì	3	3
MLT 212	Histopathology and Cytology I	2	1	3	3
MLT 213	Haematology and Blood Group Serology I	2	1	3	3
MLT 214	Chemical Pathology I	2	1	3	3
MLT 215	Medical Parasitology and Entomology I	2	1	3	3
MLT 216	Introduction to Medical Laboratory Management,	2	1	3	3
	Organization & Ethics II				
MLT 217	Research Methodology	2	-	2	2
BMS 211	Basic Anatomy and Physiology	1	1	2	2
BCH 222	Introduction to Biochemistry	1	1	2	2
ENT 216	Introduction to Entrepreneurship II	2	1	3	3
MSQ	Mandatory Skills Qualification	-	-	-	2
TOTAL		18	9	27	29

## YEAR II SEMESTER II

COURSE	COURSE	L	D	CU	СН
CODE	COURSE				CII
MLT 221	Medical Microbiology II	2		3	3
MLT 222	Histopathology and Cytology II	2	1	3	3
MLT 223	Haematology and Blood Group Serology II	$\frac{2}{2}$	1	3	3
MLT 224	Chemical Pathology II	2	1	3	3
MLT 225	Medical Parasitology and Entomology II	2	1	3	3
MLT 226	Introduction to Immunology and Virology	2	_	2	$\frac{3}{2}$
MI T 227	During	<u> </u>	-	4	4
TOTAL	Troject	11	6	21	21
IOIAL		11	U	41	21
	Project C. Y. A. T. C. C. Y. T				
	16				

# YEAR I SEMESTER I

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY				
COURSE TITLE: INTRODUCTION TO MEDICAL	COURSE CODE: MLT N	CONTACT HOURS: 3		
LABORATORY SCIENCE I	CREDIT UNITS: 3	THEORETICAL: 3		
YEAR: I SEMESTER: I	PRE-REQUISITE:	PRACTICAL: NIL		
GOAL: This course is designed to provide students with the basic knowledge in Medical Laboratory Science				
GENERAL OBJECTIVES: On completion of this course, the students should be able to:				
1.0 Know the concept of Medical Laboratory Science				
2.0 Know the history and development of Medical Laboratory Science				
3.0 Know hazard and universal precaution in Medical Laboratory Science				

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	RAMME: NATIONAL D					2112
		COURSE CODE: MLT 111		CONTACT HOURS: 3		
LABO	RATORY SCIENCE		CREDIT UNIT:	3	THEORETICA	L: 3
YEAR	: I SEMESTER: I		PRE-REQUISIT	E:	PRÁCTICAL:	NIL
COUR	SE SPECIFICATION: TH	EORETICAL		1	) '	
GOAL	: This course is designed to	provide students with th	e basic knowledge	in Medical L	aboratory Scien	ice
GENE	RAL OBJECTIVE 1.0: Kn	now the concept of Medic	al Laboratory Scie	nce	-	
		•		<b>\</b> '		
THEC	RETICAL CONTENT			PRACTICA	L CONTENT	
Week	Specific Learning	Teacher's Activities	Resources	Specific	Teacher's	Resources
	Outcome			Learning	Activities	
				Outcome		
1-5	1.1Define Medical	Explain Medical	Multimedia			
	Laboratory	Laboratory Science	Projector			
	Science		Screen,			
	1.2List the branches	Explain the	Internet			
	of Medical	branches of	Textbooks			
	Laboratory	Medical Laboratory	Computer			
	Science	Science Science	Flip charts			
			Journals			
	<ul> <li>Haematology</li> </ul>	<ul> <li>Haematology</li> </ul>				
	Blood Transfusion	Blood				
	Science	Transfusion				
	Medical	Science				
	Microbiology	Medical				
	<ul> <li>Parasitology</li> </ul>	Microbiology				

	Medical	<ul> <li>Parasitology</li> <li>Immunology</li> <li>Clinical Chemistry</li> <li>Forensic Science</li> <li>Histopathology</li> <li>Histochemistry</li> <li>Virology</li> <li>Mycology</li> <li>Exfoliative Cytology</li> <li>Laboratory Management</li> <li>Explain the branches of Medical Laboratory</li> <li>Science in 12</li> </ul>				
GENE	RAL OBJECTIVE 2.0: K	now the history and deve	lopment of Medica	al Laboratory So	cience	
6-10	<ul><li>2.1 Define history</li><li>2.2 Explain history of</li></ul>	Explain history  Explain history of  Medical Laboratory  Science	Multimedia Projector Screen, Internet Textbooks Computer Flip charts			

2.3 Explain the development of Medical Medical Laboratory Science:  • International • National  Explain the development of Medical Laboratory Science:  • International • National	
Madical Laboratory Laboratory Science:	
Science:	
International     International	
National     National	
2.4 Explain the factors Explain the factors	
affecting the affecting the	
development of development of Medical	
Medical Laboratory Laboratory Science	
Science • International	
International     National	
National	
GENERAL OBJECTIVE 3.0: Know Hazard and Universal precaution in Medical Laboratory Science	
11-15 3.1 Define Hazard Explain Hazard Multimedia	
Projector	
3.2 List types of Explain types of Screen,	
hazards in Medical hazards in Medical Internet	
Laboratory Science Textbooks	
Computer	
3.3 Explain hazards in Explain hazards in Flip charts	
Medical Laboratory	
Science Microscopes	
Specimen	
3.4 Define Universal Explain Universal containers	
precaution precaution	

3.5 Explain Universal Precaution in	Explain Universal	
Precaution in Medical Laboratory	Precaution in Medical Laboratory	
Science	Science	

**EVALUATION: CA 30% EXAMINATION 70%** 

WATIONAL BOARD FOR THOUGHT. BIND

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY					
PROGRAMME: NATIONAL DIPLO	MA (ND) MEDICAL LABORATO	DRY TECHNOLOGY			
COURSE TITLE: HISTORY AND	COURSE CODE: MLT 112	CONTACT HOURS: 2			
PHILOSOPHY OF SCIENCE					
YEAR: I SEMESTER: I	PREREQUISITE:	THEORETICAL: 2			
	CREDIT UNIT: 2	PRACTICAL: NIL			
GOAL: This course is designed to expose	e students to the Knowledge of Scien	ce and its development.			
GENERAL OBJECTIVES: On completion	on of this course, the students should	be able to:			
1.0 Know the history of Science					
2.0 Know the Philosophy of Science					
3.0 Know the history of Medicine					
4.0 Understand the laws of nature to ever	yday life				
The original tile laws of mature to ever	SOMBOTION				
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PROGE	RAMME: NATIONAL	DIPLOMA (ND) N	IEDICAL LAI	SORATORY T	_		
COURS	<b>SE TITLE:</b> HISTORY A	AND CO	COURSE CODE: MLT 112 C		CON	CONTACT HOURS: 30 HRS	
PHILOSOPHY OF SCIENCE			EDIT UNIT: 2	4	THEC	RETICAL: 2 H	IRS
YEAR:	I SEMESTER: I	PR	E-REQUISITE	:	PRAC	TICAL: Nil	
GOAL:	This course is designed	to expose students to	the Knowledge	e of Science and	its dev	velopment.	
	AL OBJECTIVE: 1.0 F			<b>4</b> 1		•	
Week	Specific Learning	Teacher's	Resources	Specific Learni	ng	Teacher's	Resources
	Outcome	Activities		Quicome	0	Activities	
				7			
1-3	1.1Define Science	Explain Science	Textbooks				
			Whiteboard?				
	1.2Explain the nature	Explain the nature	Marker				
	Science	Science	Multimedia				
			Projector				
	1.3Explain the origin	Explain the origin of					
	of Science	Science	Lecture notes				
GENER	AL OBJECTIVE 2.0: I	Know the Philosophy	of Science				
4.0	0.1 D.C. DI.1 1	D 1 1 1	TD (1 1				
4-8	2.1 Define Philosophy	Explain Philosophy					
			Whiteboard				
	2.2 Define Philosophy						
	of Science	of Science	Multimedia				
			Projector				
	2.3Explain Philosophy	<b>Explain Philosophy</b>	Laptops				

	of Science	of Science	Lecture			
			notes			
	2.4 Explain the scope	Explain the scope of		CALEDICA		
	of Philosophy of	Philosophy of		<b>\</b>		
	Science	Science			. ^	
	2.5 Explain the nature	Explain man and his				
	of man	origin				
	2.6 Describe man and					
	his origin					
<b>GENER</b>	AL OBJECTIVE 3.0: K	Know the history of M	ledicine 🔨	<b>&gt;</b>		
9- 12	3.1 Define Medicine	Explain Medicine	Textbooks			
	3.2 List the branches of	,	Whiteboard			
	Medicine	Explain History of	Marker			
	3.3 Explain History of	Medicine and its				
	Medicine	branches	Projector			
			Laptops			
	3.4 Explain the History	_	Lecture			
	of Medical	of Medical	notes			
	Laboratory Science					
GENER.	AL OBJECTIVE 4.0: U	nderstand the laws of	nature to ever	yday life		
13-15	1.1 Define the laws of	Explain the laws of	Textbooks			
	nature	nature	Whiteboard			
	1.2 Explain the laws of	,	Marker			
	nature to everyday	Explain the laws of	Multimedia			
	life 🗼	nature to everyday	Projector			

	life	Laptops		7	
		Lecture notes	4	>	

**EVALUATION: CA 30% EXAMINATION 70%** 

PROGRAMME: NATIONAL DIPLOMA (ND	) MEDICAL LABORATORY SCIENCE						
COURSE TITLE: GENERAL	COURSE CODE: MLT 113 CONTACT HOURS: 2						
MATHEMATICS	CREDIT UNITS: 2 THEORETICAL: 2						
YEAR: I SEMESTER: I	PRE-REQUISITE: PRACTICAL:						
GOAL: This course is designed to provide studen	ts with the knowledge of General Mathematical and its Applicability in						
Medical Laboratory Science							
GENERAL OBJECTIVES: On completion of this course, the students should be able to:							
1.0Know basic Algebra and Mathematical Essentials and their applications in Medical Laboratory Science							
2.0Know Set Theory and Functions, and their App							
3.0Know Trigonometry and its Application in Me	dical Laboratory Science						
AATIONALIBOARDIOR TELESCOPE							
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Medical
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fraction	ns.				
S.	• Surds.			CATION	
• Surds.					
20105	Calculate Ratios				
	and Proportions				
1.5.Calculate	r				
Ratios and	Solve Percent			)	
Proportions	Problems				
1					
1.6.Solve			MCALES		
Percent	Illustrate				
Problems	Properties of				
	Exponents		<b>)</b>		
1.7.Illustrate					
Properties of	Illustrate	Q,			
Exponents	Significant				
	digits				
1.8.Illustrate		) ′			
Significant	1				
digits	Illustrate Area				
	vs. Volume and				
1.9.Illustrate	Units 🔨 🗡				
Area vs.					
Volume and					
Units					
	<b>, , , , , , , , , ,</b>				
	7				

GENERAL OBJEC	CTIVE 2.0: Know Set Theory a	and Functions, and	their Applications i	in Medical Laborato	ry Science
Science				<b>1 1 1 1 1 1 1 1 1 1</b>	
2.1. Illust	rate Illustrate	Multimedia			
• Set the	eory. • Set theory.	Projector			
• Set uni	ion and • Set union	Screen,			
interse	ection. and	Internet		$\triangleright$	
• Types	of intersection.	Textbooks		7	
Sets.	• Types of	Computer	<b>*</b>		
• Sets ar	nd Sets.	Flip charts			
Venn-	Sets and	Journals			
diagra	ms. Venn-				
	diagrams.				
2.2. Solv	e		O'		
Equati	on of Solve Equation				
linear	circles of linear circles				
and El	lipses. and Ellipses.	&O,			
2.3. Illust	trate Illustrate				
Functi	ons Functions and				
and	relationships	<b>X</b> •			
relatio					
betwee	en the roots of a				
roots o	of a quadratic				
quadra	tic equation and the				
equation	on and coefficients.				
the					
coeffic	zients. Illustrate				

		D : 1	
	raa	Remainder	
	Illustrate	theorem	
	emainder		
	eorem		
ENERAL OF	BJECTIVE	E 3.0: Know Trigonometry	and its Applicat
3.1 Des	scribe the	Describe the	Multimedia
mather	natical	mathematical	Projector
concep	t of	concept of	Screen,
trigono	metry.	trigonometry.	Internet
	·		Textbooks
3.3. Illi	ustrate	Illustrate	Computer
Trigon	ometric	Trigonometric	Flip charts
expone		exponential	Journals
Function		Function.	
3.4. Illı	ustrate	Illustrate	
Trigon	ometric	Trigonometric	<b>A</b>
logaritl		logarithmic	
functio		functions.	<b>,</b>
3.5. Illi	ustrate	Illustrate maxima	
maxim		and minima in	
minima		trigonometry	
trigono			
22.25.10	J	Illustrate	
3.6 Illu	ıstrate	tangential and	
tangent	tial and	normal in	

normal in	triconomatry		JURIION	
normal in	trigonometry.			
trigonometry.	Illustrate Sine,			
3.7. Illustrate	cosine, and			
Sine, cosine, and	tangent.			
tangent.	tangent.			
tangent.	Illustrate			
3.8. Illustrate	circular	, <b>&gt;</b>	7	
measurements and	and small			
small angles.	angles.			
	measurements and small angles.			
		31		
		<i>3</i> 1		

# YEAR I SEMESTER II

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY						
COURSE TITLE: INTRODUCTION TO	COURSE CODE: MLT 121	CONTACT HOURS: 2				
MEDICAL LABORATORY SCIENCE II	CREDIT UNITS: 2	THEORETICAL: 2				
YEAR: I SEMESTER: II	PRE-REQUISITE: MLT 111	PRACTICAL:				
GOAL: This course is designed to provide students with the basic knowledge in Medical Laboratory Science						
GENERAL OBJECTIVES: On completion of this co						
1.0 Understand the Concept of testing in Medical Laboratory Science						
2.0 Understand regulations in Medical Laboratory practice						
3.0 Know quality control in Medical Laboratory prac	tice					

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-		L DIPLOMA (ND) MI					
COURS			OURSE COD	DE: MLT 121	CONTACT HOURS	: 30	
MEDIC	AL LABORATORY S	CIENCE II $\overline{CI}$	REDIT UNIT	·: 2	THEORETICAL: 2		
YEAR:	I SEMESTER: II	PI	RE-REQUISI	TE: MLT 111	PRACTICAL:		
COURS	COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL:	This course is designe	d to provide students w	ith the basic l	knowledge in Medic	cal Laboratory Science	e	
	<u>~</u>	Inderstand the Concept			<u> </u>		
	RETICAL CONTENT	1	<u>U</u>	PRACTICALCO			
Week	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources	
1-4	1.1Define	Explain Medical	Multimedia				
		-	Projector				
	Laboratory		Screen,				
	~	Explain what is a	Internet				
		Specimen	Textbooks				
	1.2Explain		Computer				
	what is a	Explain the specimen	Flip charts				
	Specimen	in each branch of	Journals				
		Medical Laboratory					
		Science 🗸 💙					
	1.3List the						
	I *	Explain specimen					
	in each	containers					
	branch of	,					
	Medical 🔨	Éxplain collection of					
	Laboratory	specimen in 1.3					

				T
Science			$\sim$	
	Explain transportation		10°	
1.4Explain	of specimen			
specimen	1			
containers			CATION	
	Explain methods of	4		
1.5Explain	testing of specimen in	ALEI CALEI		
collection	Medical Laboratory			
of	Wiedical Laboratory			
	E - 1.1 - 41.			
specimen	Explain the			
in 1.3	importance of testing			
	in Medical Laboratory			
1.6 Explain	$\mathcal{L}$	$\mathcal{O}'$		
transportat	Explain the role of			
ion of	Medical Laboratory			
specimen	personnel in Medical			
	Testing			
1.7List				
methods of				
testing of				
specimen				
in Medical	<b>Y</b>			
Laboratory	Explain chents			
Laboratory				
1 OFwalain	in Medical			
1.8Explain	Laboratory			
the	Testing			
importance				

	T	Г		<u> </u>	<b>A</b>	
	of testing					
	in Medical			CHILL	$\mathbf{v}_{\lambda}$	
	Laboratory					
	1.9Explain					
	the role of				$\circ$	
	Medical					
	Laboratory			Y		
	personnel					
	in Medical					
	Testing					
	1.10 Explain			O <sub>k</sub>		
	clients in					
	Medical		2			
	Laboratory		\$ Ch			
	Testing					
GENER.	AL OBJECTIVE 2.0:	Understand regulation	s in Medical	Laboratory practice		
5-10	2.1Define	Explain	Multimedia	•		
	regulations	regulations	Projector			
	2.2Define		Screen,			
	regulations in	Explain	Internet			
	Medical	regulations in	Textbooks			
	laboratory	Medical	Computer			
	practice	laboratory	Flip charts			
		practice	Journals			
	2.3 Explain the	4				
1			•			

	usla of assylatory	Eveloin the vale of
	role of regulatory	Explain the role of
	bodies in Medical	regulatory bodies in
	Laboratory	Medical Laboratory
	Training and	Training and Practice
	Practice	
<b>GENER</b>	AL OBJECTIVE 3.0:	Know quality control in Medical Laboratory practice
11-15	3.1 Define quality	Explain quality control Multimedia
	control	Projector
		Explain quality control Screen,
		in Medical Laboratory Internet
	control in Medical	
	Laboratory	Computer
	Practice	Explain types of Flip charts
	Tructice	quality controls in Journals
	3.3 List types of	Medical Laboratory
	quality controls in	
		practice
	Medical	
	•	Explain
	practice	importance of quality
		control in Medical
	3.4 Explain the	Laboratory practice
	importance of	
	quality control in	
	Medical	
	Laboratory	
	practice	
<u>I</u>	4	)

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY						
COURSE TITLE: FIRST AID AND	COURSE CODE: MLT 122	CONTACT HOURS: 30				
PRIMARY HEALTHCARE	CREDIT UNITS: 2	THEORETICAL: 2				
YEAR: I SEMESTER: II	PRE-REQUISITE:	PRACTICAL: –				

GOAL: This course is designed to provide students with basic knowledge and skills of First Aid and Primary Health Care

GENERAL OBJECTIVES: On completion of this course, the students should be able to:

- 1.0Know Basic concepts of First Aid
- 2.0Understand the Basic Concepts of Primary Health Care
- 3.0Know the Elements of Primary Health Care
- 4.0Understand the Concept of Public Health
- 5.0Understand role of Medical Laboratory Science in Primary Health Care
- 6.0Know Primary Health Care Related organisations and their functions
- 7.0Know the Concept of Infection Prevention and Control

PROGRAMME: NATIONAL DIPLOMA (NI	D) MEDICAL LABORATORY	TECHNOLOGY
COURSE TITLE: FIRST AID AND	COURSE CODE: MLT 122	CONTACT HOURS: 30
PRIMARY HEALTHCARE	CREDIT UNITS: 2	THEORETICAL: 2
YEAR: I SEMESTER: II	PRE-REQUISITE:	PRACTICAL: –
COURSE SPECIFIFCATION: THEORETICAL	L	

GOAL: This course is designed to provide students with basic knowledge and skills of First Aid and Primary Health Care

GENERALOBJECTIVE 1.0: Know Basic Concepts of First Aid

THEO	THEORETICAL CONTENT			PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources
1-2	1.1 Define First Aid	Explain First Aid	Multimedia Projector			
	1.2 Explain the Aims of First Aid	Explain the Aims of First Aid	Internet Textbooks Computer			
	1.3 Explain the scope of First Aid	Explain the scope of First Aid	Flip charts Journals			
	1.4 List examples of First Aid	Explain examples of First Aid				
	1.5 Define Accident and Emergency	Explain Accident and Emergency				
	1.6 Explain First Aid in Accidents and	Explain First Aid in Accidents and				

Emergency Care	Emergency Care				
	•				
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				,	
	the laboratory				
•	Inderstand the Perio of	naants of Drin	nory Hoolth Cara		
			lary Hearth Cale		
1	1				
Health Care	Health Care				
		•			
_	-				
•	•				
Care	Health Care	_			
_	-	Journals			
,	_	2			
Care in Healthcare	Care in Healthcare	<b>)</b>			
delivery	delivery				
2.4 Explain the	Explain the				
importance of	importance of				
Primary Health	Primary Health				
Care in					
Healthcare					
delivery					
· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·				
	_				
	<ul> <li>2.1 Define Primary Health Care</li> <li>2.2 Explain the scope of Primary Health Care</li> <li>2.3 Explain the aim of Primary Health Care in Healthcare delivery</li> <li>2.4 Explain the importance of Primary Health Care in</li> </ul>	1.7 Explain First Aid Care of accidents in the laboratory  AL OBJECTIVE 2.0: Understand the Basic co 2.1 Define Primary Health Care  2.2 Explain the scope of Primary Health Care  Care  2.3 Explain the aim of Primary Health Care in Healthcare delivery  2.4 Explain the importance of Primary Health Care in Healthcare delivery  2.5 Explain the Structure of  Explain First Aid Care of accidents in the laboratory  Explain Primary Health Care  Explain the aim of Primary Health Care in Healthcare delivery  Explain the importance of Primary Health Care in Healthcare delivery Explain the Structure of	1.7 Explain First Aid Care of accidents in the laboratory  AL OBJECTIVE 2.0: Understand the Basic concepts of Prin 2.1 Define Primary Health Care  2.2 Explain the scope of Primary Health Care  2.3 Explain the aim of Primary Health Care in Healthcare delivery  2.4 Explain the importance of Primary Health Care in Healthcare delivery  2.5 Explain the Structure of  Explain First Aid Care of accidents in the laboratory  Multimedia Projector Screen, Internet Textbooks Computer Flip charts Journals  Primary Health Care in Healthcare delivery  Explain the importance of Primary Health Care in Healthcare delivery Explain the Structure of	1.7 Explain First Aid Care of accidents in the laboratory  AL OBJECTIVE 2.0: Understand the Basic concepts of Primary Health Care  2.1 Define Primary Health Care Health Care  Care of accidents in the laboratory  Multimedia Projector Screen, Internet Textbooks Computer Flip charts  2.3 Explain the aim of Primary Health Care in Healthcare delivery  Care in Healthcare delivery  2.4 Explain the importance of Primary Health Care in Healthcare delivery  2.5 Explain the Structure of  Explain First Aid Care of accidents in the laboratory  Multimedia Projector Screen, Internet Textbooks Computer Flip charts Journals  Primary Health Care in Healthcare delivery  Explain the importance of Primary Health Care in Healthcare delivery  Explain the Structure of	1.7 Explain First Aid Care of accidents in the laboratory  AL OBJECTIVE 2.0: Understand the Basic concepts of Primary Health Care  2.1 Define Primary Health Care Health Care Frimary Health Care  Care of accidents in the laboratory  Multimedia Projector Screen, Internet Textbooks Computer Flip charts  Journals  Primary Health Care in Healthcare delivery  2.4 Explain the importance of Primary Health Care in Health Care  Explain the importance of Primary Health Care in Healthcare delivery  2.5 Explain the Structure of  Explain First Aid Care of accidents in the laboratory  Multimedia Projector Screen, Internet Textbooks Computer Flip charts Journals  Primary Health Care in Healthcare delivery  2.4 Explain the importance of Primary Health Care in Healthcare delivery  Explain the Structure of

	Care	Care			$\sim$	
					<b>10</b> )	
	2.6 Explain the	Explain the				
	Functions of	Functions of			,	
	Primary Health	Primary Health				
	Care	Care				
	2.7 Explain role of	Explain role of		CALEDICA		
	Medical	Medical				
	Laboratory in	Laboratory in				
	Primary Health	Primary Health				
l l	Care	Care		<b>&gt;</b>		
	ERAL OBJECTIVE 3.0		f Primary Héa	lth Care	<u> </u>	
_	3.1 Explain the		Multimedia			
	Elements of	of Primary Health	Projector			
	Primary Health	Care	Screen,			
	Care		Internet			
			Textbooks			
	3.2 List the	Explain the	Computer			
	Elements of	Elements of V	Flip charts			
	Primary Health	Primary Health	Journals			
	Care	Care				
	3.3 Explain the	Explain the role				
	role of these	of these elements				
	elements in	in Primary				
	Primary Health	Health Care				

	Care delivery	delivery	
GENI	ERAL OBJECTIVE 4.0	: Know the Concept of	Public Health
7-8	4.1 Define Public	Explain Public	Multimedia
	Health	Health	Projector
			Screen,
	4.2 Explain the	Explain the scope	Internet
	scope of Public	of Public Health	Textbooks
	Health		Computer
		Explain the	Flip charts V
	4.3 Explain the	Components of	Journals
	Components of	Public Health	
	Public Health		
		Explain the role of	
	4.4 Explain the	Medical Laboratory	
	role of Medical	Science in Public	
	Laboratory	Health	
	Science in		
	Public Health		
GENER A	AL OBJECTIVE 5.0: U	nderstand the Role of M	Medical Laboratory Science in Primary Health Care
9-10	5.1 Define	Explain Medical	Multimedia
	Medical	Laboratory	Projector
	Laboratory	Science	Screen,
	Science		Internet
	5.2 Explain the	Éxplain the Role	Textbooks
	Role of	of Medical	Computer
	Medical	Laboratory	Flip charts

	Laboratory	Science in	Journals
	Science in	Primary Health	
	Primary Health	Care delivery	
	Care delivery	·	
GENER	AL OBJECTIVE 6.0: K	now Primary Health C	are Related Organisations and their functions
11-12	6.1 List Primary	Explain Primary	Multimedia
	Health Care	Health Care	Projector
	Related	Related	Screen,
	Organisations	Organisations	Internet
			Textbooks
	6.2 List the	Explain the	Computer
	functions of	functions of	Flip charts
	Primary Health	Primary Health	Journals
	Care Related	Care Related	
	Organisations	Organisations	
	6.3 Explain the	Explain the X	
	functions of	functions	
	Primary Health	Primary Health	
	Care Related	Care Related	
	Organisations	Organisations	
GENER			fection Prevention and Control
13-15	7.1 Define	Explain Infection	Multimedia
	Infection		Projector
		Explain types of	Screen,
	7.2 Explain types	infections	Internet
	of infections		

7.3 Explain the	Explain the	Textbooks			
-	_				
nature of	nature of	Computer		(O)	
Infections	Infections	Flip charts			
	Explain the	Journals		,	
7.4 List the	classifications of				
classifications	Infections				
of Infections					
	Explain the				
7.5 Explain the	elements of				
elements of	Infection				
Infection	Prevention and				
Prevention and	Control		•		
Control					
	Explain the role				
7.6 Explain the	of Medical	2			
role of Medical	Laboratory				
Laboratory	Science in				
Science in	Infection				
Infection	Prevention and				
Prevention and	Control				
Control					

EVALUATION: CA 30% EXAMINATION 70%

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY							
COURSE TITLE: PHILOSOPHY, LOGIC	COURSE CODE: MLT 123	CONTACT HOURS: 30 HOUR					
AND CRITICAL REASONING	CREDIT UNITS: 2	THEORETICAL: 2					
YEAR: I SEMESTER: II	PRE-REQUISITE:	PRACTICAL:					
GOAL: This course is designed to provide stude	ents with the rudiments of philo	ophy, Logic and Critical Reasoning					
GENERAL OBJECTIVES: On completion of th	is course, the students should b	e able to:					
1.0 Know the history, concepts and application of Philosophy.							
2.0 Understand the concept and application of Logic							
3.0 Know the concept, techniques and application	n of Critical Reasoning.						

				,	
ROGRAMME: NATIONAL	L DIPLOMA (ND) M	EDICAL LA	BORATORY TEC	HNOLOGY	
COURSE TITLE: PHILOSO	PHY, LOGIC AND C	OURSE COL	DE: MLT 123	CONTACT HOU	RS: 30 HOURS
CRITICAL REASONING	$\overline{\mathbf{C}}$	REDIT UNIT	: 2	THEORETICAL	: 2
YEAR: I SEMESTER: II		RE-REQUISI		RACTICAL:	
COURSE SPECIFIFCATION:				<del>)</del>	
GOAL: This course is designe			<del></del>	Logic and Critica	1 Reasoning
GENERALOBJECTIVE 1.0: F	*				<i>C</i>
THEORETICAL CONTENT	¥ *	1 11	PRACTICAL CON		
Week Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources
1.2 Explain the scope of philosophy	Explain the history of philosophy:	Multimedia Projector Sereen, Intérnet Textbooks Computer Flip charts Journals			

	1	1	1	<u> </u>	
Augustine and	Augustine and			$\rightarrow$	
Aquinas	Aquinas			<b>(O)</b>	
_	_			CATION	
● Modern	<ul><li>Modern</li></ul>				
philosophy:	philosophy:				
Descartes,	Descartes,				
Hume, Kant	Hume, Kant				
			THICALTIC		
1.4 List the branches	Explain the branches				
of philosophy:	of philosophy:				
Metaphysic	<ul> <li>Metaphysic</li> </ul>				
	J. J.				
<ul> <li>Epistemology</li> </ul>	<ul> <li>Epistemology</li> </ul>				
		$\sim$	$\bigcup_{\lambda}$		
• Ethics	• Ethics				
A 11 11	A .1	0, 4			
Aesthetics	• Aesthetics				
1.5 Explain some	Explain some basic	€°			
basic concepts of	concepts of	) '			
philosophy:	philosophy:				
•The mind-body	•The mind body				
problem.	problem				
problem.	problem				
•Theories of	•Theories of				
consciousness	consciousness				
	( )				
Personal identity	Personal identity				
and the self.	and the self.				

	T	T				
	1.6 Explain the					
	application of				$\Delta O^{\gamma}$	
	Philosophy in real					
	world Issues					
<b>GENER</b>	AL OBJECTIVE 2.0:	Understand the concep	t and applicat	tion of Logic	10°	
5-10	2.1. Define logic	Explain logic	Multimedia		$\triangleright$	
	2.2 Explain the scope	Explain the scope of	Projector			
	of logic	logic	Screen,	<b>Y</b>		
	2.3. List types of	Explain types of logic	Internet	CALE		
	logic	Explain the following	Textbooks			
	2.4 Explain the	logical concept:	Computer			
	following logical	<ul> <li>Propositions</li> </ul>	Flip charts			
	concept:	~	Journals 🔨	Q'		
	<ul> <li>Propositions</li> </ul>	• Statements				
	• Statements	Truth	COR,			
	• Truth	Validity	X			
	• Validity	Explain the role of logic in reasoning and				
	2.5 Explain the role	argument O				
	of logic in reasoning	Explain Arguments				
	and argument	and their components				
	2.6 Explain					
	Arguments and their	$KO_{y}$				
	components					
	2.7 Explain the	7				
	application of Logic					

		T	<u> </u>	1
Know the concept, tech	nniques and a	pplication of Critical	Reasoning.	
Explain critical	Multimedia			
reasoning	Projector			
	Screen,	4		
Explain the concept of	Internet		$\circ$	
Critical Reasoning	Textbooks			
	Computer	<b>Y</b>		
Explain techniques of	-			
-	Journals			
Explain the				
characteristics of		O <sub>k</sub>		
Critical Reasoning				
	2,4			
Explain the	V.			
-				
	) '			
Explain Critical				
Explain the				
/ <del>*</del>				
	Explain critical reasoning  Explain the concept of Critical Reasoning  Explain techniques of critical reasoning  Explain the characteristics of Critical Reasoning  Explain the characteristics of a Critical Thinker.  Explain the barriers to Critical Reasoning  Explain Critical	Explain critical reasoning  Explain the concept of Critical Reasoning  Explain techniques of critical reasoning  Explain the characteristics of Critical Reasoning  Explain the characteristics of a Critical Thinker.  Explain the barriers to Critical Reasoning  Explain Critical Reasoning	Explain critical reasoning  Explain the concept of Critical Reasoning  Explain techniques of critical reasoning  Explain the characteristics of Critical Reasoning  Explain the characteristics of a Critical Thinker.  Explain the baffiets to Critical Reasoning  Explain Critical Reasoning  Explain the baffiets to Critical Reasoning  Explain Critical Reasoning	reasoning  Explain the concept of Critical Reasoning  Explain techniques of critical reasoning  Explain the characteristics of Critical Reasoning  Explain the characteristics of a Critical Thinker.  Explain the baffies to Critical Reasoning  Explain Gritical Reasoning  Explain Gritical  Reasoning Techniques  Explain the

Reasoning in real		<b>A</b>	
world Issues		<b>10</b> >	

**EVALUATION: CA 30% EXAMINATION 70%** 

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PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY									
COURSE TITLE: INTRODUCTION TO	COURSE CODE: MLT 124	CONTACT HOURS: 45 HOUR							
MEDICAL LABORATORY INFORMATION	CREDIT UNITS: 3	THEORETICAL: 1							
MANAGEMENT SYSTEM (MLIMS)									
YEAR: I SEMESTER: II	PRE-REQUISITE:	PRACTICAL: 2							
GOAL: This course is designed to enable students gain knowledge and skill of Medical Laboratory Information									
Management.									
GENERAL OBJECTIVES: On completion of this cou	rse, the students should be able	to:							
1.0 Understand the concept of data in Medical Laborat	tory Information Management								
2.0 Understand Information Management in Medical I	Laboratory								
3.0 Understand the Storage and Retrieval of Medical I	3.0 Understand the Storage and Retrieval of Medical Laboratory Data								
4.0 Understand Documentation and Records in Medica	4.0 Understand Documentation and Records in Medical Laboratory								
5.0 Understand Medical Laboratory Information Mana	5.0 Understand Medical Laboratory Information Management								

6.0 Know the internet of things (IoT) in Medical Laboratory Practice

7.0 Understand data protection in medical laborators

DDOCDAMME NATIONAL DIDI OMA (ND) MEDICAL LADODATIONAL DECIDIOS OFIS									
	PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
			COURSE CODE: MLT 124		CONTACT HOURS: 60 HOURS				
	AL LABORATORY	INFORMATION	CREDIT UNIT	Γ: 2	THEORETICAL: 1				
MANA(	GEMENT SYSTEM				<u> </u>				
YEAR:	I SEMESTER: II	F	PRE-REQUIS	ITE:	PRÁCTICAL: 2				
COURS	E SPECIFICATION: T	HEORETICAL ANI	D PRACTICA	L					
GOAL:	This course is design	ned to enable stude	ents gain kno	wledge and skill o	f Medical Laborato	ry Information			
Manager	ment.			<b>4</b> , <b>y</b>					
GENER	ALOBJECTIVE 1.0: U1	nderstand the concep	t of data in Mo	edical Laboratory In	formation Manageme	ent			
THEOR	RETICAL CONTENT			PRACTÍCAL CON	ITENT				
Week	Specific Learning	Teacher's	Resources	Specific Learning	Teacher's	Resources			
	Outcome	Activities		Outcome	Activities				
1-2	1.1 Define data	Explain data	Multimedia	Identify Data in	Guide the students	Record books			
			Projector	Medical Laboratory	to:	Text books			
	1.2 Explain	Explain	Screen,			General			
	sources and	sources and	Internet	Identify sources of	Identify Data in	register			
	types of Data	types of Data	Textbooks	Data in Medical	Medical	Computer			
			Computer	Laboratory	Laboratory	Internet			
	1.3 Explain Data	Explain Data	Journals						
	in Medical	in Medical			Identify sources of				
	Laboratory	Laboratory			Data in Medical				
					Laboratory				
	1.4 Explain	Explain							
	sources of data	sources of data							
	in Medical	in Medical							
	Laboratory.	Laboratory.							

Medi Labo • Acc • Acc • Tim • Con • Priv patic info • Secu data 1.6Exp imp Info Mar in M	e and e of data in cal ratory essibility uracy eliness fidentiality acy of ent rmation urity of ; lain the ortance of rmation nagement fedical oratory etice	Explain the scope and nature of data in Medical Laboratory • Accessibilit y • Accuracy • Timeliness • Confidential ity • Privacy of patient information • Security of data;  Explain the importance of Information Management in Medical Laboratory	ANICAL EDIS	
		Laboratory Practice		

GENER.	GENERAL OBJECTIVE 2.0: Understand Information Management in Medical Laboratory								
3-4	2.1Define	Explain	Multimedia	Identify Medical	Guide the students	Sample			
	Information	Information	Projector	Laboratory registers	tor	Registers			
	Management	Management	Screen,	۸	<b>*</b>				
			Internet	Make entry into the	Identify Medical				
	2.2 Define	Explain	Textbooks	Medical Laboratory	Laboratory				
	Information	Information	Computer	Registers 🔷	registers				
	Management	Management	Journals	Y					
	in Medical	in Medical			Make entry into the				
	Laboratory	Laboratory			Medical				
					Laboratory				
	2.3 Explain	Explain			Registers				
	Medical	Medical		<b>y</b>					
	Laboratory	Laboratory							
	Registers	Registers	2						
			Or						
	2.4 Explain the	Explain the							
	structure of	structure of							
	Medical	Medical							
	Laboratory	Laboratory							
	Registers.	Registers							
GENER.	AL OBJECTIVE 3.0: U	Inderstand the Storag	ge and Retriev	al of Medical Labora	tory Data				
5-6	3.1 Define Data	Explain Data	Multimedia	Identify data storage	Guide the students	Register			
	Storage	Storage	Projector	methods	to:	Computers			
		,	Screen,			Internet			
	3.2 Define Data	Explain Data	Internet	Identify Data	Identify data	Wooden			
	retrieval	retrieval	Textbooks	retrieval Methods	storage methods	shelves			

3.3 List types of	Explain types	Computers			Cabinets
Data storage		Journals	Store Data	Identify Data	Fire proof
methods	methods			retrieval Methods	cabinets
3.4 List types of	Explain types of		Retrieve Data		Flash drives
data retrieval	data retrieval			Store Data	Hard Drive
methods	methods		Archive Data		Memory Card
				Retrieve Data	CD ROM
3.5 Explain types	Explain types				Cloud
of data storage	of data storage			Archive Data	Google Drive
and data	and data				
retrieval	retrieval				
methods.	methods.				
			<b>)</b>		
3.6 Define	Explain	Y			
Archive in	Archive in	2			
Information	Information	O			
Management.	Management.	\$			
0.5.5					
3.7 Explain	Explain				
archiving of	archiving of				
Data in	Data in				
Medical	Medical				
Laboratory	Laboratory				
2.0 E1-1-4	C1-i 41:-				
3.8 Explain the	Éxplain the				
Challenges in	Challenges in				
storage and	storage and				

		I	1	1		<u> </u>
	retrieval of	retrieval of				
	Data in	Data in			$\Delta O_{\lambda}$	
	Medical	Medical				
	Laboratory.	Laboratory.				
					) <sup>k</sup>	
GENER.	AL OBJECTIVE 4.0: U	nderstand Documen	tation and Rec	ords in Medical Labo	oratory	
7-8	4.1 Define	Explain	Multimedia	Identify Document	Guide the students	Registers
	Documents	Documents	Projector	and Records in	to:	Internet
			Screen,	Medical Laboratory		Sample
	4.2 Define Records	Explain Records	Internet		<b>Identify Document</b>	Document
			Textbooks	Classify Medical	and Records in	Sample record
	4.3Explain	Explain	Computer 💉	Laboratory	Medical	
	Documents and	Documents	Journals	Documents	Laboratory	
	Records in	and Records in			-	
	Medical	Medical	2	Classify Medical	Classify Medical	
	Laboratory	Laboratory	Or	Laboratory Records	Laboratory	
	·		K C		Documents	
	4.4 Explain types of	Explain types of		Fill Documents		
	Documentation	Documentation			Classify Medical	
	and Records in	and Records in		Manage Records	Laboratory	
	Medical	Medical			Records	
	Laboratory.	Laboratory.				
	•				Fill Documents	
	4.5 Explain	Explain				
	classification of	classification			Manage Records	
	Documents and	of Documents				
	Records in	and Records in				

Medical	Medical				
Laboratory	Laboratory				
Laboratory	Laboratory				
4.6 Explain the	Explain the			ATION	
importance of	importance of		<b>(</b>	) <b>\</b> ^	
Documentation	Documentatio				
and Records in	n and Records				
Medical	in Medical				
Laboratory	Laboratory				
	<i>y</i>				
4.7 Explain	Explain		ALED C		
Documents and	Documents and		<b>&gt;</b>		
Records control	Records control	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	<b>Y</b>		
in Medical	in Medical	RIECK			
Laboratory	Laboratory	O Y			
		OF			
4.8 Explain the	Explain the	2			
challenges in	challenges in	,			
Documentation	Documentation and				
and Records in	Records in Medical				
Medical	Laboratory				
Laboratory	Y				
GENERAL OBJECTIVE 5.0: 1	Understand Medical L	aboratory Infor	rmation Management		
9-10 5.1 Explain the	Explain the	Multimedia			
Medical	Medical	Projector			
Laboratory	Laboratory	Screen,			
Information	Information	Internet			

Management.	Management.	Textbooks			
Management.	ivianagement.				
5 2 Evaloin the	Explain the	Computer Journals			
5.2 Explain the	Explain the	Journals			
development of	development of				
Medical	Medical			<i>)</i>	
Laboratory	Laboratory				
Information	Information				
Management	Management				
System (MLIMS)	System (MLIMS)				
			ALEIV .		
5.3 Explain	Explain				
MLIMS under	MLIMS under				
the following:	the following:		<b>y</b>		
<ul> <li>Applications</li> </ul>	<ul> <li>Applications</li> </ul>				
<ul> <li>Manufacturer</li> </ul>	<ul> <li>Manufacturer</li> </ul>	2			
• Features	• Features				
• Function	• Function	K			
• Environment	• Environment				
- Environment	- Ziiviioiiiidiity				
5.4 Explain the merits	Explain the merits				
and demerits of	and demerits of				
MLIMS	MLIMS				
TVILLIVIS					
5.5 Explain	Explain				
Challenges of	Challenges of				
MLIMS	MLIMS				
INITIMIS	1411711419				

GENER.	AL OBJECTIVE 6.0: K	now the Internet of	Things (IoT) in Medical Laboratory Practice
11-12	6.1 Explain Internet	Explain Internet of	Multimedia
	of Things (IoT)	Things (IoT) in	Projector
	in relation to	relation to	Screen,
	Medical	Medical	Internet
	Laboratory	Laboratory	Textbooks
			Computers Journals Wifi Routers
	6.2 Explain the uses	Explain the uses	Journals
	and application of	and application	Wifi
	IoT in Medical	of IoT in	Routers
	Laboratory	Medical	
		Laboratory	
	6.3 Explain the	Explain the	
	merits and	merits and	
	demerits of IoT	demerits of	
	in Medical	IoT in Medical	
	Laboratory	Laboratory	
	practice	practice	
	_	Explain the	
	challenges of	challenges of	
	IoT in Medical	IoT in Medical	
	Laboratory	Laboratory	
GENER.	AL OBJECTIVE 7.0; U	nderstand data prote	ection in Medical Laboratory
13-15	7.1Define Data	Éxplain Data	Multimedia
	Security and	Security and	Projector
	privacy.	privacy.	Screen,

security and privacy in Medical	Explain data security and privacy in Medical Laboratory practice	-		ATION	
Privacy Act in relation to Medical Laboratory	Explain Data Privacy Act in relation to Medical Laboratory Practice		MICALEDU		
-	Explain cybersecurity	RIFE			
Challenges of Cybersecurity attacks on Data in	Explain Challenges of Cybersecurity attacks on Data in Medical Laboratory				

EVALUATION: CA 40% EXAMINATION 60%

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY									
COURSE	TITLE:	MEDICAL	COURSE CODE: MLT 125	CONTACT HOURS: 45 HRS					
LABORAT	ORY TECHNIQUES		CREDIT UNITS: 3	THEORETICAL: 2					
YEAR: I	SEMESTER: II		PRE-REQUISITE:	PRACTICAL: 1					
$COAI \cdot Th$	is course is designed to	nrovido studon	eta with the basis knowledge and	Wills of Madical laboratory Tachniques					

GOAL: This course is designed to provide students with the basic knowledge and skills of Medical laboratory Techniques

GENERAL OBJECTIVES: On completion of this course, the students should be able to:

1.0Know Medical Laboratory Techniques

2.0Know Phlebotomy Techniques

3.0Understand Medical Microbiology Techniques

4.0Understand Chemical Pathology Techniques

5.0Understand Haematology Techniques

6.0Understand Histopathology Techniques

	$\Lambda$								
PROGI	PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COURS	SE TITLE: MEDICA	AL LABORATORY	COURSE	CODE: MLT 125	CODE: MLT 125 CONTACT HOURS: 45 HRS				
TECHN	IQUES		CREDIT U	INIT: 3	THEORETICAL: 2				
YEAR:	I SEMESTER: II		PRE-REQ		RACTICAL: 1				
COURS		N: THEORETICAL A	_		<del>)</del>				
GOAL:	This course is design	ned to provide students	s with the bas	sic knowledge of Medica	l laboratory Technic	ues			
		) Know Medical Labo			•				
THEO	RETICAL CONTEN	T		PRACTICAL CONTE	NT				
Week	Specific Learning	Teacher's Activities	Resources	Specific Learning	Teacher's	Resources			
	Outcome			Outcome	Activities				
1-2	1.1 Define Medical			Identify the types of	Guide students	PPEs			
	Laboratory	Laboratory	Projector	medical laboratory	to:	Microscopes			
	Techniques	Techniques	Screen,	techniques	Identify the	Thermometer			
			Whiteboard		types of medical	s Microtomes			
	1.2 Explain types	Explain types of	and marker,	Use PPE appropriately	laboratory	Glassware			
	of medical	medical laboratory	Internet,		techniques	Safety			
	laboratory	techniques;	Textbooks,	Demonstrate basic		Manual			
	techniques;	<ul> <li>Medical</li> </ul>	Computer	medical laboratory safety	y Use PPE				
	<ul> <li>Medical</li> </ul>		Flip charts	measures.	appropriately				
	Microbiology	<ul> <li>Chemical</li> </ul>	Journals						
	<ul> <li>Chemical</li> </ul>	pathology		Apply basic rules and	Demonstrate				
	pathology	Haematology		regulations in medical	basic medical				
	<ul> <li>Haematology</li> </ul>	Histopathology		laboratory practice	laboratory safety				
					measures.				

Г		_		
<ul> <li>Histopathology</li> </ul>			Perform Medical	
			Laboratory tests using the	Apply basic
			following techniques:	rules and
1.3 Explain the	Explain the			regulations in
importance of	importance of		<ul> <li>Medical Microbiology</li> </ul>	medical
medical laboratory	medical laboratory			laboratory
techniques	techniques			practice
			<ul> <li>Histopathology</li> </ul>	
1.4Explain the	Explain the			Perform Medical
importance of	importance of			Laboratory tests
medical	medical laboratory			using the
laboratory	testing		Identify Simple laboratory	following
testing			wares, equipment and	techniques:
	Explain simple		their uses in medical	
1.5Explain simple	laboratory wares,	2	laboratory	Medical
laboratory	equipment and their		,	Microbiology
wares,	uses in medical			Chemical
equipment and	laboratory			pathology
their uses in				Haematology
medical	Explain basic	<b>Y</b>		Histopathology
laboratory	medical laboratory			
-	safety measures.			
1.6 Explain basic				
medical	Explain basic rules			Identify Simple
laboratory	and regulations in			laboratory
safety	medical laboratory			wares,
measures.	practice.			equipment and

CENED	rules and regulations in medical laboratory practice. 1.8 Explain various safety equipment used in medical laboratory	Explain various safety equipment used in medical laboratory	Tachniques		their uses in medical laboratory	
	AL OBJECTIVES: 2  2.1 Define	2.0 Know Phlebotomy		Douts	Guide students	Vacutainer
3-4	Phlebotomy	1 1 1	Multimedia Projector		to:	Vacutainer Vacutainer
	i incooloniy	Explain Phlebotomy	Screen,		Perform:	Holder
	2.2 Explain		Internet	Capmary puncture     Arterial		Phlebotomy
	Phlebotomy	recimque	Textbooks		ure	beds
	Technique	Explain types of	~ ``	Identify materials for	Capillary	Chairs
	_	Phlebotomy		Phlebotomy		Needles
	2.3 Explain types	•	Iournals	i meodiomy	Arterial	Syringes
	of Phlebotomy	Venipuncture	Glass wares		1 11 10 11 10 1	Tourniquets
	Technique:	• Capillary			Identify	Antiseptic
	<ul> <li>Venipunctur</li> </ul>	puncture				wipes
	e	<ul> <li>Arterial</li> </ul>			Phlebotomy	Lancet
	<ul> <li>Capillary</li> </ul>	10)				Capillary tube
	puncture	List materials for				Slides
	• Arterial	Phlebotomy				Blood Sample
	7	•				containers

	1		T	T		
	2.4 List					
	materials for				<b>40</b> >	
	Phlebotomy					
GENER	RAL OBJECTIVE 3.0	): Understand Medica	al Microbiolo	gy Techniques		
5-6	3.1Define Medical	Explain Medical	Multimedia	Perform Specimen	Guide students	Microscopes
	Microbiology	Microbiology	Projector	collection and processing	to:	Incubators
	Techniques	Techniques	Screen,		Perform	Autoclave
	3.2 List types of	Explain types of	Internet	Perform Macro	Specimen	Centrifuges
	Medical	Medical	Textbooks	Microscopic examination	collection and	Glasswares
	Microbiology	Microbiology	Computer	of specimen	processing	Samples
	Techniques	Techniques	Flip charts			Specimen
			Journals	Perform Culture and	Perform Macro/	Containers
	3.3 Explain	Explain	Microscope	sensitivity techniques	Microscopic	
	microbiology	microbiology	s, sample		examination of	
	Specimen	Specimen collection	and		specimen	
	collection and	and processing	Specimen			
	processing		containers		Perform Culture	
		Explain Macro/			and sensitivity	
	3.4 Explain Macro/	Microscopic	<b>,</b>		techniques	
	Microscopic	examination of			•	
	examination of	specimen 🗸 💙				
	specimen	Explain Culture and				
	3.5 Explain Culture					
	and sensitivity	techniques				
	techniques					
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	<b>,</b> ,				
	<b>→</b>	<b>)</b>				
L	<u> </u>		1	<u>l</u>	<u>l</u>	

GENER	AL OBJECTIVE 4.0	): Understand Chemi	cal Pathology	Techniques		
7-8	4.1Define	Explain Chemical	Multimedia	Perform Specimen	Guide students	Urinalysis Kit
	Chemical	Pathology	Projector	collection and processing	to.	Sample
	Pathology		Screen,	in Chemical Pathology	Perform	Containers
		Explain types of	Whiteboard		Specimen	Centrifuges
	4.2 List types of	Chemical Pathology	and marker,	Perform Chemical	collection and	Spectrophoto
	Chemical	Techniques	Internet,	examination of blood,	processing in	meter
	Pathology	1	Textbooks,	urine and stool	Chemical	Automatic
	Techniques	Explain Specimen	Computer,		Pathology	Pipette
	_	collection and	Flip charts,			PPE
	4.3 Explain	processing in	Journals		Perform	Glassware
	Specimen	Chemical Pathology	Glass wares		Chemical	
	collection and				examination of	
	processing in	Explain the			blood, urine and	
	Chemical	Chemical			stool	
	Pathology	examination of	<b>~</b>			
		blood and urine in				
	4.4 Explain the	chemical pathology	67			
	Chemical		, ,			
	examination of	Explain basic '				
	blood and urine in	instrumentation in				
	chemical pathology	chemical pathology				
	4.5 Describe basic	$AO_{\lambda}$				
	instrumentation in					
	chemical pathology	<b>&gt;</b> *				
	7	<b>Y</b>				

GENERAL OBJECTIVE 5.0: Understand Haematology Techniques								
9-11	5.1 Define	Explain	Multimedia	Perform Blood collection	Guide the	Microscopes		
	Haematology	Haematology	Projector	and processing	students to:	Haematocrit		
			Screen,		Perform Blood	Centrifuge		
	5.2 List types of	Explain types of	Internet	<u> </u>		Bucket		
	Haematology	Haematology	Textbooks	Perform Full blood count	processing	Centrifuge		
	Techniques	Techniques	Computer	(FBC)		Capillary		
			Flip charts	Y		Tubes		
	_	1 1		Prepare Blood films and		EDTA		
	1	of Blood collection	Glass wares	Examine \(\frac{1}{2}\)		Container		
		and processing	and		` /	Blood		
	processing		microscope.			collection		
	-	Explain Full blood			Prepare Blood			
	blood count (FBC)	count (FBC)	•			Stains		
			2	<b>'</b>		Staining		
	_	Explain Blood film	$\sim O_{\lambda}$			Racks		
		examination	T T					
		: Understand Histop	, , , , , , , , , , , , , , , , , , ,			T		
12-15	6.1 Define	Histopathology 🦴			Guide the students			
	Histopathology		Projector	/ <b>1</b>		Microscope		
		Explain types of		1	Perform Specimen			
		Histopathology	Internet	Histopathology	,	Slide racks		
	Histopathology	Techniques	Textbooks			Slides		
	Techniques		Computer	I F		Cover slips		
		Explain Specimen	Flip charts		1	Embedding		
	6.3 Explain	,	Journals			medium		
	Specimen	preservation and				Reagents and		

collection,	processing in			$\rightarrow$	Chemicals
preservation and	Histopathology				
processing in					
Histopathology	Explain basic				
	instrumentation in				
6.4 Describe basic	Histopathology				
instrumentation in					
Histopathology					
Tistopuniorogy					
	1			•	•
<b>EVALUATION: CA 40</b> °	0/0				
<b>EXAMINATION 60%</b>					
		O)			
			~		
		<b>O Y</b>			
		•			
	$\sim$				
	processing in Histopathology  Explain basic instrumentation in Histopathology				
,					
	X,				
>					
			67		

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY									
COURSE TITLE: INTRODUCTION TO	COURSE CODE: MLT 126	CONTACT HOURS: 30 HOURS							
MEDICAL LABORATORY MANAGEMENT,	CREDIT UNITS: 2	THEORETICAL: 2							
ORGANIZATION & ETHICS I									
YEAR: I SEMESTER: II	PRE-REQUISITE:	PRACTICAL: NIL							

GOAL: This course is designed to enable students acquire basic knowledge of Laboratory Management, Organization and Ethics

GENERAL OBJECTIVES: On completion of this course, the students should be able to:

- 1.0 Understand the role of medical laboratory science in health care
- 2.0 Understand the principles of Management
- 3.0 Know quality assurance and quality control
- 4.0 Know safety measures in medical laboratories
- 5.0 Understand the leadership in Health Facility
- 6.0 Know the ethics and Good Medical Laboratory Practice
- 7.0 Know preventive maintenance and care of laboratory equipment

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY									
COURSE TITLE: INTRODUCTION TO MEDICAL		CONTACT HOURS: 45 HOURS							
LABORATORY MANAGEMENT,	CREDIT UNIT: 2	THEORETICAL: 2							
ORGANIZATION & ETHICS I									
YEAR: I SEMESTER: II	PRE-REQUISITE:	PRACTICAL: 1							
COURSE SPECIFICATION: THEORETICAL		No.							

GOAL: This course is designed to enable students acquire basic knowledge of Laboratory Management, Organization and Ethics

GENERALOBJECTIVE 1.0: Understand the role of medical laboratory science in health care

THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources
1-2	1.1 Explain Health care	Explain Health care	White Board Maker, Projector,			
	1.2 Explain Medical Laboratory Science in health care	Explain Medical Laboratory Science in health care	Reference books like MLSCN Act, Journals Posters,			
	1.3 Explain Medical Laboratory Science regulation in health care	Explain Medical Laboratory Science regulation in	Computer			

	1.4 Explain the roles of medical laboratory science in healthcare delivery	health care  Explain the roles of medical laboratory science in healthcare delivery			CATION	
	AL OBJECTIVE 2.0: U		· · · · · · · · · · · · · · · · · · ·	ment	1	
3-4	2.1 Define	Explain	White			
	Management	Management	Board/Mak			
	2.2 Explain the		er Board,			
	difference	Explain the	Projector,			
	between	difference	Reference			
	management and	between	books,			
	Administration	management	Posters,	•		
	2.3 Explain the 14	and	Computer			
	Fayol's principle	Administration				
	of Management	E1-: 41 14	$\mathbf{O}'$			
	0.4 Evaloia	Explain the 14				
	2.4 Explain	Fayol's	1			
	techniques of	principle of				
	planning	Management				
		Explain techniques				
		of planning.				
GENER A	AL OBJECTIVE 3.0: K	now quality assurance	e and quality	control		
5-6		Explain Quality	White			
	<b>\</b>					

Assurance and	Assurance and	Board			
	Quality Control	Maker,			
3.2 Explain types	Quality Control	Projector,			
	Explain types	Reference		ATIO	
	of Quality	books,	~		
Quality Control	Assurance and	Journals,			
	Quality Control	Posters,			
3.3 Explain		Internet,			
-	Explain	Computer			
	benefits of	1	MCALLER		
medical laboratory	Quality				
· · · · · · · · · · · · · · · · · · ·	Assurance in				
3.4 Explain the	medical				
-	laboratory				
	Explain the		•		
	following	OF			
-External quality	terms:				
control	-Internal	$\mathcal{O}'$			
-Precision	quality control				
-Accuracy	-External				
-Standard	quality control				
deviation	-Precision				
	-Accuracy				
3.5 Explain quality in	-Standard				
relation to medical	deviation				
laboratory results	<b>,</b>				
Pre-analytical	Éxplain quality in				

		1						
	<ul> <li>Analytical</li> </ul>	relation to medical			CATION			
	<ul> <li>Post Analytical</li> </ul>	laboratory results			$\Delta O_{\lambda}$			
	stages	Pre-analytical						
		<ul> <li>Analytical</li> </ul>			~ <b>~ *</b>			
		• Post		1				
		Analytical			)			
		stages						
GENERAL OBJECTIVE 4.0: Know safety measures in medical laboratories								
7-8	4.1 Explain	Explain	White	Identify types of	Guide students	PPE		
	Universal	Universal	Board	1	to:	Colour codes		
	Precaution	Precaution	Maker,		Identify types of	Waste Bins		
			Projector,	Identify the steps in	laboratory waste	Charts		
	4.2 Explain	Explain sample	Reference _	laboratory waste		Video clips		
	sample	management	books,	management	Identify the steps	Model of		
	management		Journals		in laboratory	Incinerator		
		Explain	Posters,	Use PPE appropriately	waste	Autoclave		
	4.3 Explain	laboratory	Internet,		management			
	laboratory waste	waste	Computer	Dispose Laboratory				
	management	management		waste	Use PPE			
					appropriately			
	4.4 Explain types	Explain types						
	of laboratory	of laboratory			Dispose			
	waste	waste			Laboratory			
	management	management			waste			
	4.5 Explain steps	Explain steps in						
	in laboratory	laboratory						

	waste	waste		
	management	management		
	4.6 Explain	Explain		
	Personal	Personal		
	Protective	Protective		
	Equipment (PPE)	Equipment		
		(PPE)		
	4.7 Explain	,		
	Material Safety	Explain		
	Data Sheet	Material Safety		
	(MSDS)	Data Sheet		
		(MSDS)		
	4.8 Describe	,		
	safety signs and	Explain safety signs	0	
	symbols in	and symbols in	VOE.	
	medical laboratory	medical laboratory		
GENER.	AL OBJECTIVE 5.0: Un	derstand the leadersh	np in Health	Facility
9-10	5.1 Define	Explain	White	Demonstrate Inter and Guide students Organisational
	leadership	leadership (	Board	Intra-departmental to: Charts
	_		Maker,	relationships of
	5.2 Explain types	Explain types	Projector,	personnel in a typical Demonstrate
	of leadership	of leadership	Reference	health facility. Inter and Intra-
	styles	styles	books,	departmental
			Journals,	relationships of
	5.3 Explain the	Explain the	Posters,	personnel in a
	qualities of a good	qualities of a	Internet,	typical health

	leader	good leader	Computer		facility	
	5.4 Explain the	Explain the role				
	role of leadership	of leadership in				
	in medical	medical		. <		
	laboratory practice	laboratory				
		practice				
	5.5 Explain Inter					
	and Intra-	Explain Inter and				
	departmental	Intra-departmental				
	relationships of	relationships of		CALEDI		
	personnel in	personnel in health				
	health facility.	facility.		$\wedge O^{\mathbf{y}}$		
GENER	AL OBJECTIVE 6.0: I	Know the ethics and Go	ood Medical¶	aboratory Practice.		
11-12	6.1 Define ethics	Explain ethics	White	<b>Y</b>		
			Board			
	6.2 Define	Explain	Maker,			
	medical laboratory	medical	Projector,			
	ethics	laboratory	Reference			
		ethics	books,			
	6.3 Explain the		Journals,			
	following ethical	Explain the	Posters,			
	concerns:	following	Internet,			
	<ul> <li>Confidentiality</li> </ul>	ethical	Computer			
	<ul> <li>Malpractice</li> </ul>	concerns:				
	• Negligence	Confidentiali				
	Medico-legal	ty				

Issues • Clients	<ul><li>Malpractice</li><li>Negligence</li></ul>		
protection	<ul> <li>Medico-legal</li> </ul>		
Patient Safety	Issues		
• Insurance for	• Clients		
professional	protection		
health hazards.	<ul><li>Patient</li></ul>		
6.4 Define Good	Safety		
Medical	<ul> <li>Insurance for</li> </ul>		
Laboratory	professional		
Practice	health		
	hazards.		
6.5 Explain the			
components of	Explain Good		
Good Medical	Medical		
Laboratory	Laboratory	\$O'	
Practice	Practice	0	
	Explain the		
	components of	<b>&gt;</b>	
	Good Medical		
	Laboratory Practice		
GENERAL OBJECTIVE 7.0: K	1 .		
13-15 7.1 Explain the	Explain the	White	Demonstrate how to Guide students Video clips
preventive	preventive		maintain and care for to:  Tools
maintenance of	maintenance of	Maker,	laboratory equipment
laboratory	laboratory	Projector,	Demonstrate
equipment	equipment	Reference	how to maintain

care of equipm	Explain the ance of	Explain the care of laboratory equipment	books, Journals, Posters, Internet, Computer		and care for laboratory equipment	
mainte	_	r				
equipm	nent	equipment				
	TION: CA 30% TION 70%	maintenance and care of laboratory equipment	DEOR			
			7	6		

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COURSE TITLE: GENERAL MATHEMATICS II	COURSE CODE: MLT 127	CONTACT HOURS: 2						
	CREDIT UNITS: 2	THEORETICAL: 2						
YEAR: I SEMESTER: II	PRE-REQUISITE:	PRACTICAL:						
GOAL: This course is designed to provide students with the knowledge of General Mathematical and its								
Applicability in Medical Laboratory Science		Ç, Y						

GENERAL OBJECTIVES: On completion of this course, the students should be able to:

- 1.0 Know Matrices and Determinants, Permutation and Combination, and their Applications in Medical Laboratory Science
- 2.0 Know Calculus and its Application in Medical Laboratory Science
- 3.0 Know basic Statistics and Tests of Significance and their Applications in Medical Laboratory Science

<b>PROG</b>	PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COURSE TITLE: GENERAL MATHEMATICS COURSE C				DE: MLT 127	CONTACT HOURS: 2				
		$\overline{\mathbf{C}}$	REDIT UNIT	: 2	THEORETICAL: 2				
YEAR:	I SEMESTER: II	P	RE-REQUISI	TE:	PRACTICAL:				
COUR	SE SPECIFICATION: 7	ΓHEORETICAL AND	PRACTICA:	L					
GENE	RAL OBJECTIVE 1.0: 1	Know Matrices and De	eterminants, F	Permutation and Co	mbination, and their	Applications in			
	1 Laboratory Science								
THEO	RETICAL CONTENT			PRACTICAL CO	NTENT				
Week	Specific Learning	Teacher's Activities	Resources	Specific Learning	Teacher's	Resources			
	Outcome			Outcome	Activities				
1-4	1.1. Illustrate	Illustrate	Multimedia	O <sub>2</sub>					
	Matrices	Matrices	Projector						
			Screen,						
	1.2. Illustrate	Illustrate	Internet						
	Algebra of	Algebra of	Textbooks						
	Matrices	Matrices	Computer						
	4.0 711		Flip charts						
	1.3. Illustrate	Illustrate	Journals						
	Determinant	Determinant and							
	and its	its properties							
	properties								
	1 / 0-1	Solve System of							
	1.4. Solve	Linear							
	System of	Equations							
	Linear	T11							
	Equations	Illustrate							

	1.5. Illustrate Permutation and Combination	Permutation and Combination			OCATION	
GENE	RAL OBJECTIVE 2.0:	Know Calculus and its	Application in	n Medical Laborator	y Science	
5-10	2.1. Derive a Function.	Derive a Function.	Multimedia Projector	1CA		
	2.2. Illustrate	Illustrate Rules	Screen, Internet	CHAIL STATE OF THE		
	Rules of Differentiatio n and its	of Differentiation and its application	Textbooks Computer Flip charts			
	application	Illustrate Chain	Journals .			
	2.3. Illustrate Chain Rule	Rule				
	2.4. Illustrate	Illustrate the differentiation of exponential and				
	differentiation	Logarithmic Functions				
	of exponential and	YO,				
	Logarithmic Functions	Mustrate the Riles of Integration				

		T	<u></u>	Τ	4	
	2.5. Illustrate					
	the Rules of	Illustrate				
	Integration	Integration by				
		Parts				
	2.6. Illustrate					
	Integration by	Illustrate				
	Parts	Integration using			)	
		Partial Functions				
	2.7. Illustrate					
	Integration	Illustrate				
	using Partial	Definite				
	Functions	Integrals				
				O <sub>Y</sub> ,		
	2.8. Illustrate					
	Definite		Q, Y			
	Integrals					
GENE	RAL OBJECTIVE 3.0.	Know basic Statistics a	nd Tests of Si	gnificance and their	Applications in Medi	cal Laboratory
Science		R	<b>y</b>	$\mathcal{E}$	11	J
11-15	3.1. Define	Define Statistics	Multimedia			
	Statistics.		Projector			
		Explain Statistics	Screen,			
	3.2. Explain	and its	Internet			
	Statistics and its	application in	Textbooks			
	application in	Medical	Computer			
	Medical	Laboratory	Flip charts			
	Laboratory	Science.	Journals			

Science.				$\rightarrow$	
	Illustrate:			CATION	
3.3. Illustrate:	<ul><li>Measures of</li></ul>				
<ul><li>Measures of</li></ul>	Central				
Central	Tendency.				
Tendency.	<ul><li>Measures of</li></ul>		4		
<ul><li>Measures of</li></ul>	Dispersion		$\Diamond$		
Dispersion	<ul> <li>Coefficient</li> </ul>		<b>Y</b>		
<ul> <li>Coefficient of</li> </ul>	of				
Variation	Variation		MCALI		
3.4. Illustrate	Illustrate				
Probabilities.	Probabilities.	Ŕ	<b>)</b>		
3.5. Define	Define				
Variables	Variables	COL			
3.6. List types of	List types of				
Variables and	Variables and				
their	their				
Classification	classification				
3.7. Define	Define				
Confidences	Contidences				
Interval and P-	Interval and P-				
values	values				
\ \ \ \ \ \					

3.8. Illustrate • Scatter	Illustrate	
	• Scatter	
diagram • Correlatio		
• Regression		
Analysis		
• Test of	• Test of	
significa	nnce significanc	
	l e	
EVALUATION: C EXAMINATION 7		Dior Thichile
	AATIO	
		82

## YEAR II SEMESTER I

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COURSE	TITLE:	MEDICAL	COURSE CODE: MLT 211	CONTACT HOURS: 45 Hour				
MICROBIO	LOGY I		CREDIT UNITS: 3	THEORETICAL: 2				
YEAR: II	SEMESTER: I		PRE-REQUISITE:	PRACTICAL: 1				
				( <b>y</b>				

GOAL: To provide students with basic knowledge and skills in Medical Microbiology

## **GENERAL OBJECTIVE**

- 1.0 Understand the concepts and historical development of Medical Microbiology.
- 2.0. Understand examination of Microorganisms.
- 3.0. Understand the environmental factors affecting the growth of Microorganisms.
- 4.0. Know Microscopy, Cultivation, Isolation and Preservation of Microorganisms.

	RAMME: NATIONAL					
COURS	SE TITLE: MEDICAL	MICROBIOLOGY I C	OURSE COL	DE: MLT 211	CONTACTHOU	RS: 45 Hours
		$\overline{\mathbf{C}}$	REDIT UNIT	T: 3	THEORETICAL:	2
YEAR:	II SEMESTER: I	P	RE-REQUISI	1	PRACTICAL: 1	
COURS	SE SPECIFICATION: 7	THEORETICAL AND	PRACTICAL		$\sim$	
GOAL:	To provide students wi	th basic knowledge and	l skills in Me	dical Microbiology	/	
	ALOBJECTIVE 1.0: U				edical Microbiolo	gy.
	RETICAL CONTENT	1		PRACTICAL CON		<u> </u>
Week	Specific Learning	Teacher's Activities	Resources	Specific Learning	Teacher's	Resources
	Outcome			Outcome	Activities	
				<b></b>		
1-4		Explain Medical	Multimedia			
	Microbiology	Microbiology	Projector			
			Screen,			
	_	Explain branches of	Internet			
	of Medical	Medical Microbiology				
	Microbiology		Computer			
		Explain scope of	Journals			
	1.3 Explain scope of	Medical Microbiology				
	Medical					
	Microbiology	Explain history of				
	1 4 1 1 1 1 4 6	Medical Microbiology				
	1.4 Explain history of					
		Explain the				
	Microbiology	relationship of				
		Medical Microbiology				

CENED	1.5 Explain the relationship of Medical Microbiology to man.	to man.  Jnderstand examination	of Migroorg	oniama	CATION	
5-7	2.1Define	Explain	Multimedia		Guide students	Microscope
3-7	Microorganisms	Microorganisms				
	Wheroorganishis	Microorganisms		structure of bacterial cell	to: Draw the	Reagents Centrifuge
	2.2 List classes of	Explain classes of	Internet	bacterial Cell		Incubator
	Microorganisms	Microorganisms		Identify	bacterial cell	Culture media
	Wheroorganisms	Whereougamsins		Microbiologica	Dacterial cell	Autoclave
		Explain the	-	l examination	Identify	Weighing
	2.3 Describe the	structure of	- ×	techniques	Microbiologic	balance
	structure of	bacterial cell	Glass wares	cermques	_	Petri dishes
	bacterial cell	Dacterial cen		Prepare culture		Hot air Oven
	bacteriai cen	Explain the		plates	teeninque	Boiling water
	2.4 List the	Morphological	,	praces	Prepare	bath
	Morphological	classification of		Perform the	culture plates	Glasswares
	classification	bacteria.		following	culture places	Slides
	of bacteria.	oucteria.		techniques:		Wire loops
	or bucteria.	Explain Bacterial		teemiques.	Perform the	Spatula
		growth curve and		<ul><li>Microscopy</li></ul>	following	Sparaia
	2.5 Explain	nutritional		• Culture	techniques:	
	Bacterial	requirement		• Biochemical		
	growth curve	<b>y</b>		tests	<ul><li>Microscopy</li></ul>	
	and nutritional	Explain		Sensitivity Sensitivity	• Culture	
		Microbiological		DOING VILY	Cuitaio	

requirement	examination	• Biochemical	
	techniques	tests	
2.6 List		Sensitivity	
Microbiologic	Explain Microscopic		
al examination techniques	Examination of bacteria		
2.7 Evaleia	Explain the		
2.7 Explain Microscopic	cultivation of		
Examination	bacteria		
of bacteria	Explain culture		
2.8 Explain the	media preparation		
cultivation of	Explain the		
bacteria	biochemical test		
2.9 Explain	for bacteria		
culture media	Explain the sensitivity		
preparation	test for bacteria		
2.10 Explain the	80'		
biochemical			
test for bacteria			
Ouctoria			
2.11 Explain the			
sensitivity test			

for bacteria				$\rightarrow$	
GENERAL OBJECTIVE 3.0	Understand the environ	mental factor	s affecting the growth	h of Microorganisms	S
8-11  3.1 Explain the environmental factors affecting the growth of Microorganis ms  3.2 Explain how these factors are provided in the laboratory  3.3 Explain the bacterial growth curve and nutritional requirements	Explain the environmental factors affecting the growth of Microorganisms  Explain how these factors are provided in the laboratory  Explain the bacterial growth curve and nutritional requirements	Multimedia Projector Screen, Internet Textbooks Computer Flip charts Journals Glass wares	CALER	CATI	
GENERAL OBJECTIVE 4.0	Know Microscopy, Cul	ivation, Isola	tion and Preservation	of Microorganisms	
12-13 4.1 Define	Explain Microscopy.	Multimedia			Reagents
Microscopy.		Projector		Perform:	Centrifuge
	Explain Microscopy	Screen,	<ul> <li>Microscopy</li> </ul>	<ul> <li>Microscopy</li> </ul>	Incubator
4.2. Explain	in Medical	Internet	(Direct and	(Direct and	Culture media
Microscopy in	Microbiology.		Stain)	Stain)	Autoclave

Medical	Explain types of	Textbooks	Cultivation	Cultivation	Weighing
Microbiology.	Microscopy.	Computer	<ul> <li>Isolation</li> </ul>	<ul> <li>Isolation</li> </ul>	balance
		Flip charts	Preservation		Petri dishes
4.3. List types of	Explain culture media.	Journals		of bacteria in the	Hot air Oven
Microscopy.		Microscope		laboratory	Boiling water
	Explain types of	slides,			bath
4.4. Define culture	culture media	Specimen			Glasswares
media.		slide and	Y		Slides
	Explain methods of	stains			Wire loops
4.5. List types of	cultivation of				Spatula
culture media	bacteria				Refrigerator
					Staining racks
4.6. Explain methods	Explain the isolation	<b>\$</b>	O <sub>2</sub>		Bunsen Burner
of cultivation of	of bacteria				
bacteria		2			
	Explain				
4.7. Explain the	the preservation of	X			
isolation of	pure culture.				
bacteria		1			
4.8. Explain					
the preservation of	<b>Y</b>				
pure culture.					

EVALUATION: CA 40%
EXAMINATION 60%

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY						
COURSE TITLE: HISTOPATHOLOGY	COURSE CODE: MLT 212	CONTACT HOURS: 3				
AND CYTOLOGY I	CREDIT UNITS: 3	THEORETICAL: 2				
YEAR: II SEMESTER: I	PRE-REQUISITE:	PRACTICAL: 1				

GOAL: This course is designed to provide students with the basic knowledge and skills of Histopathology and Cytology.

GENERAL OBJECTIVES: On completion of this course, the students should be able to:

- 1.0. Understand basic concept of Histopathology and Cytology.
- 2.0. Understand basic Tissue Preparation in Histopathology Laboratory.
- 3.0. Understand the basic Tissue Processing Techniques.
- 4.0. Understand tissue sectioning procedures.
- 5.0. Understand principles and application of cytological examination.

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY 💫						
COURS	SE TITLE: HISTOPA	ATHOLOGY AND C	OURSE COD	DE: MLT 212	CONTACT HOURS	: 3
CYTOL	OGY I	$\overline{\mathbf{C}}$	REDIT UNIT	T: 3	ΓHEORETICAL: 2	
YEAR:	II SEMESTER: I	Pl	RE-REQUISI	TE:	PRACTICAL: 1	
COURS	SE SPECIFICATION: T	HEORETICAL AND F	PRACTICAL	,		
GOAL:	This course is designed	to provide students wit	th the basic ki	nowledge and skills	of Histopathology ar	nd Cytology
GENER	ALOBJECTIVE 1.0: U1	nderstand basic concept	of Histopath	<u> </u>		
THEO	RETICAL CONTENT			PRACTICAL CON	NTENT	
Week	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources
1-3	1.1 Define:	Explain :	Multimedia			
	<ul> <li>Histology</li> </ul>	<ul> <li>Histology</li> </ul>	Projector			
	<ul> <li>Histopathology</li> </ul>	<ul> <li>Histopathology</li> </ul>	Screen,			
	Cytology	Cytology	Internet Textbooks			
	1.2. Explain:	Explain:	Computer			
	<ul> <li>Histology</li> </ul>	• Histology	Flip charts			
	<ul> <li>Histopathology</li> </ul>	<ul> <li>Histopathology</li> </ul>	Journals			
	• Cytology	Cytology	Glass wares			
	1.3 Describe basic	Explain basic				
	structure of cell	structure of cell				
	and its function.	and its function.				
		Explain:				
	•Biopsy	●Biopsy				

1	Explain ion in atholog Cytology tory	•Autopsy •Autolysis •Putrefaction.  Explain Reception in Histopathology and Cytology Laboratory			JCATION	
CENEDAL ODIEC		·	Duamanatian	History Halla are Lat	a anata mi	
		derstand basic Tissue I				D (
4-7 2.1 Define		_		μ)		Reagents
2.2 List typ		1 01	3	/	1	Fixatives
Tissues				$\mathcal{C}$		Containers
2.3 Explain		1		±	8	Cassettes
Preparati		reparation in		• 0	1	Tissue
Histopat	hology Hi	istopathology	1		decalcifying fluids.	Decalcifying
	Ex	xplain the	lip charts	decalcification of a	Perform the	Fluid
2.4 Explain	n the M	lethods of	Journals	Bone Tissue	decalcification of a	
Methods	of Ti	issue OV	Glass wares	specimen	Bone Tissue	
Tissue	Pr	reparation.		Determine the end	specimen	
Preparati				point of	Determine the end	
2.5 Define	Ex	xplain Fixation		decalcification	point of	
Fixation					decalcification	
2.6 Explain	ı Ex	xplain Fixation				
Fixation		nd its				
importar	ce. im	nportance.				

	2.7 Explain fixatives 2.8 Explain the classification and composition of fixatives. 2.9 Enumerate the advantages and disadvantages of fixatives. 2.10 Define Decalcification 2.11 Explain the aims of decalcification 2.12 Describe methods of decalcification 2.13 Explain methods of determination of end point of	Explain fixatives  Explain the classification and composition of fixatives.  Explain the advantages and disadvantages of fixatives.  Explain Decalcification  Explain the aims of decalcification  Describe methods of decalcification  Explain methods of determination of end point.				
	end point of decalcification	determination of end point of decalcification				
		Inderstand the basic Tis		T * * * * * * * * * * * * * * * * * * *		D
8-11	3.1. Explain Tissue	7 1		Demonstrate Tissue		Reagents Ice block
	1188ue	Processing	Projector	processing	Demonstrate	nce block

Processing	Explain methods	Screen,	Perform Embedding	Tissue processing	Wax
	of Tissue		Prepare blocks from		Hot plate
-	Processing.		_	Embedding	Water bath
Tissue	i rocessing.				Video clips
	Explain the steps	Flip charts		from selected tissue	
	in tissue	Journals		pieces.	
-	processing	Glass wares		preces.	
processing	processing	Class wares			
	Explain the steps				
_	in tissue		CHILLE		
-	processing				
3.5 Explain	processing				
-	  Explain	_			
_	Dehydration and				
-	its importance in				
	tissue processing.				
3.6 Enumerate	dissue processing.	<b>\$</b>			
	Explain type of	<b>,</b>			
	dehydrating <b>C</b>				
•	agents.				
3.7 Explain	agents.				
clearing and					
C	Explain clearing				
	and types of				
3.8 Define:	clearing agents				
•Infiltration	agonto				
- minuation	Explain:				
		I			1

	•Embedding	•Infiltration			4	
	•Impregnation	•Embedding			LIO,	
	•Blocking	•Impregnation				
	3.9 List types of	•Blocking				
	embedding stations.	Explain types of embedding media Explain embedding stations.		CALE	CATION	
GENER	AL OBJECTIVE 4.0: U		ing procedui	res		
12-15		Explain	Multimedia	Identify Microtome	Guide students to:	Microtome
	<u> </u>	Microtomy	3	parts.	Identify	Microtome
	4.2 Describe		Screen,	Identify Microtome	_	Knives
	Microtomes and	Explain	Internet	knives	Identify	Tissue block
	their uses	Microtomes and	Textbooks	Demonstrate	Microtome knives	Video clips
		their uses	Computer	Microtomy	Demonstrate	Pictorials
	4.3 List types of		Flip charts		Microtomy	
		Explain types of	Journals			
		microtomes and	Glass wares			
	and	their Advantages				
	disadvantages.	and				
	4.4. List types of	disadvantages.				
	Microtome	Explain types of				
	Knives	Microtome				
		Knives				
	4.5 Explain the					

following:	Explain the	
<ul> <li>Sharpening</li> </ul>	following:	
•Honing	<ul><li>Sharpening</li></ul>	
•Polishing	•Honing	
•Stropping	•Polishing	
	•Stropping	
4.6. Explain		
Mounting of	Explain Mounting	
section	of section	
4.7. Explain the		
Use of tissue	Explain the Use of	
floatation bath.	tissue floatation bath.	

**EVALUATION: CA 40% EXAMINATION 60%** 

PROGRAMME: NATIONAL DIPLOMA (ND) MI	EDICAL LABORATORY TE	CHNOLOGY				
COURSE TITLE: HAEMATOLOGY AND BLOOD	COURSE CODE: MLT 213	CONTACT HOURS: 45				
GROUP SEROLOGY I	CREDIT UNIT: 3	THEORETICAL: 2				
YEAR: II SEMESTER: I	PRE-REQUISITE:	PRACTICAL: 1				
GOAL: This course is designed to provide students with	th the basic knowledge and skill	s in Haematology and Blood Group				
Serology						
<b>GENERAL OBJECTIVES</b> : On completion of this co	ourse, the students should be abl	e to:				
1.0 Understand composition and functions of blood						
2.0 Understand Haematopoiesis.						
3.0 Know anticoagulants in Haematology and Blood G	3.0 Know anticoagulants in Haematology and Blood Group Serology					
4.0 Understand collection and preservation of blood.						
5.0 Understand blood Group Serology and Blood Banking						
6.0 Know blood antigens and antibodies						

PROGI	RAMME: NATIONAL D	IPLOMA (ND) MED	OICAL LABO	RATORY TECH	HNOLOGY	
	SE TITLE: HAEMAT	TOLOGY AND COU	JRSE CODE:	MLT 213 C	CONTACT HOURS:	45
BLOOD	BLOOD GROUP SEROLOGY I CREDIT UNI			Т	HEORETICAL: 2	
YEAR:	II SEMESTER: I	PRE	-REQUISITE	: P	RACTICAL: 1	
COURS	E SPECIFIFCATION: TI	HEORETICAL AND I	PRACTICAL	$\sim$		
GOAL:	This course is designed to	provide students with	the basic kno	wledge and skills	in Haematology and	d Blood Group
Serolog	y					
GENER	ALOBJECTIVE 1.0: Und	erstand composition ar	nd functions o	f blood.		
THEO	RETICAL CONTENT			PRACTICAL CO	ONTENT	
Week	Specific Learning	Teacher's	Resources	Specific Learnin	g Teacher's	Resources
	Outcome	Activities		Outcome	Activities	
1-3	1.1 Define Blood	-	Multimedia			
	1.01.441		Projector			
	1.2 List the	Explain the composit				
	compositions of blood	blood	Internet Textbooks			
	blood	Evaloin the				
	1.2 Evaloin the	-	Computer Journals			
	1.3 Explain the composition of	composition of blood.	Journals			
	blood.	010001.				
	blood.	Explain				
	1.4 Differentiate	components of				
	components of	blood				
	blood	Explain				
	7	functions of				

	1.5 List functions of blood	blood				
GENER	AL OBJECTIVE 2.0: Und	⊥ derstand Haematopoies	sis			
3-4	2.1 Define	Explain	Multimedia			
	Haematopoiesis	Haematopoiesis	Projector			
	2.2 Explain:	Explain:	Screen,	TO ALEIN		
	<ul><li>Erythropoiesis</li></ul>	• Erythropoiesis	Internet	Y		
			Textbooks			
	•Leucopoiesis	•Leucopoiesis	Computer			
	<ul> <li>Thrombopoiesis</li> </ul>	•Thrombopoiesis	Flip charts			
	Thromoopolesis	Thromooporesis	Journals 💉			
				,		
	RAL OBJECTIVE 3.0: Kn	ow anticoagulants in H	Haematology a	and Blood Group Ser	ology	
5-7	3.1 Define	Explain	Multimedia	Prepare	Guide students to:	Reagents
	anticoagulants	anticoagulants	Projector	anticoagulants.	Prepare	Weighing
	3.2 List types of	Explain types of	Screen,		anticoagulants.	balance
	anticoagulants in	anticoagulants	Internet			Glassware
	Haematology and	in Haematology	Textbooks			Spatula
	Blood Group	and Blood	Computer			Specimen
	Serology	Group Serology	Flip charts			container
	3.3 Explain types of	Explain types of	Journals			
	anticoagulants in	anticoagulants				
	Haematology and	in Haematology				
	Blood Group	and Blood				
	Serology	Group Serology				
	3.4 Explain the principle	Explain the principle				

	and uses of anticoagulants in Haematology and Blood Group Serology	and uses of anticoagulants in Haematology and Blood Group Serology			CATION	
	3.5 Explain composition of each anticoagulants	_				
	in Haematology and Blood Group Serology	Blood Group	<u> </u>	MCA		
GENE	 RAL OBJECTIVE 4.0: Und	Serology erstand collection and	l preservation.	of blood		
8-10	<ul> <li>4.1 Explain collection and preservation of blood in Haematology and Blood Group Serology</li> <li>4.2 Explain types of blood collection in Haematology and Blood Group Serology</li> </ul>	Explain collection and preservation of blood in Haematology and Blood Group Serology  Explain types of blood collection in Naematology and Blood Group Serology		Perform blood collection:  • Capillary  • Venous	Guide the students to: Perform blood collection:  • Capillary  • Venous	Syringes & Needle Tourniquet Disinfectant Blood sample containers Lancet Dry and Wet Swab Vacutainer Vacutainer holder
	4.3 List blood	Explain blood				

GENER	collection equipment in Haematology and Blood Group Serology 4.4 Explain safety measures in blood collection RAL OBJECTIVE 5.0: Und	collection equipment in Haematology and Blood Group Serology Explain safety measures in blood collection			CATION	
11-13	5.1Define blood group serology 5.2 Define blood banking 5.3. Explain the importance of blood banking 5.4 List the equipment required for blood banking	Explain blood group serology Explain blood banking Explain the importance of blood banking Explain the equipment required for blood banking	Multimedia Projector Screen, Internet Textbooks Computer Flip charts Journals	Identify blood bank		Blood bank refrigerator Blood donor's chair Weighing balance Water bath Plasma extractor
GENER 14-15	6.1 Define: •Antigen •Antibody	ew blood antigens and Explain: • Antigen • Antibody	Multimedia Projector Screen, Internet Textbooks			

6.2 Explain blood: •Antigen	Explain blood: •Antigen	Computer Flip charts Journals		TION	
•Antibody	•Antibody				
<ul><li>6.3 List types of Blood</li></ul>	Explain types of Blood Antigens and Antibodies Explain blood antigen and antibody reaction		ANICAL EDI		
6.5. Define Blood			,		
Group Systems	Explain Blood				
6.6 Explain Blood	Group Systems				
Group Systems	Explain Blood Group Systems	KO'			

**EVALUATION: CA 40% EXAMINATION 60%** 

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COURSE TITLE: CHEMICAL PATHOLOGY I COURSE CODE: MLT 214 CONTACT HOURS: 3								
	CREDIT UNITS: 3 THEORETICAL: 2							
YEAR: II SEMESTER: I PRE-REQUISITE: PRACTICAL: 1								
GOAL: This course is designed to provide student.	s with the basic knowledge and s	skilkin Chemical Pathology						

GENERAL OBJECTIVES: On completion of this course, the students should be able to:

- 1.0Understand the significance of Chemical pathology.
- 2.0Understand carbohydrates, proteins and lipids in Chemical Pathology
- 3.0Know Chemical Pathology Laboratory Equipment
- 4.0Know Blood Chemistry
- 5.0Know Urine and Stool Analysis.
- 6.0Know anticoagulants in Chemical Pathology
- 7.0Know protein precipitation agents and preparation of Protein-free Filtrate
- 8.0Know Collection and preservation of specimen in Chemical Pathology

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PROGR	PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY						
COURS	COURSE TITLE: CHEMICAL PATHOLOGY I			E: MLT 214	CONTACT HOURS: 3		
			CREDIT UNIT:	3	THEORETICAL: 2	2	
YEAR:	II SEMESTER: I		PRE-REQUISIT	E: I	PRACTICAL: 1		
COURS	E SPECIFICATION: T	HEORETICAL AN	D PRACTICAL	$\sim$			
GOAL:	This course is designed	to provide students v	with the basic know	owledge and skill	n Chemical Pathol	logy	
GENER	ALOBJECTIVE 1.0: U1	nderstand the signific	cance of Chemic	al pathology in hea	alth.		
THEOI	RETICAL CONTENT			PRACTICAL CO	ONTENT		
Week	Specific Learning	Teacher's	Resources	Specific Learning	g Teacher's	Resources	
	Outcome	Activities	نم	Outcome	Activities		
1-2	1.1 Define Chemical	Explain Chemical	Lecture notes				
	pathology	Pathology	Pictures (				
			Charts				
	_	Explain the	Books				
	significance of	significance of	Journals				
	Chemical	Chemical	Computer				
	pathology in health	pathology in	Projector				
		health (	DVD				
	1.3 Explain how	8	Multimedia				
	Chemical	Explain how	Player				
	Pathology in	Chemical	Whiteboard				
	diagnosis and	Pathology in	Marker				
	treatment	diagnostics and					
	monitoring	treatment					
		monitoring					

]	1.4 List tests in chemical pathology  1.5 Discuss the importance of Chemical Pathology analysis	Explain tests in chemical pathology  Explain the importance of Chemical Pathology analysis	ALEDÍA DE Chamical		
3-4	AL OBJECTIVE 2.0: U 2.1 Define carbohydrate 2.2 Explain the classification and composition of carbohydrates 2.3 Define protein 2.4 Explain the classification and composition of Proteins 2.5 Define lipids	Explain carbohydrate  Explain the classification and composition of carbohydrates  Explain protein  Explain the classification and composition of Proteins	 Identify the classes and compositions of:  • Carbohydrates (sugars)  • Proteins  • Lipids	Guide Students to:  Identify the classes and	Water Bath Bunsen Burner Tripod Stand Reagents Glassware Standard Solutions Gas

	2.6 Explain the classification and composition of lipids	Explain the classification and composition of lipids			CATION	
	2.3 Explain the importance of carbohydrate, protein and fats in provision of energy for body metabolism	Explain the importance of carbohydrate, protein and fats in provision of energy for body metabolism	RIE			
GENER	AL OBJECTIVE 3.0: k	Know Chemical Patho	ológy Laborator	y Equipment		
5-6	3.1 List the vital Chemical Pathology Laboratory	Explain the vital Chemical Pathology Laboratory	Lecture notes Pictures Charts Books	Identify Chemical Pathology Laboratory Equipment		Colorimeter, Spectrophoto meter, Flame
	Equipment	Equipment	Journals	Identify components		photometer Centrifuge
	3.2 Describe the basic Principle,	Explain the basic Principle,	1	·	Laboratory Equipment	PH Meter Water Bath
	components and use of Colorimeter	components and use of Colorimeter	Projector	• Spectrophoto meter,	Identify	

and	and	DVD/Multime	• Flame	components of:
Spectrophotometer	Spectrophotometer		photometer	
				er,
3.3 Explain the	Explain the	Whiteboard/M	Use:	Spectroph
basic Principle,	basic	arker	Colorimeter	r, otometer,
components	Principle,		<ul> <li>Spectropho</li> </ul>	• Flame
and use of	components		meter,	photomete
Flame	and use of		• Flame	r
photometer	Flame		photometer	
	photometer			Use:
3.5 Define				Colorimet
Automation in	Explain	نم		er,
Chemical	Automation in			• Spectroph
Pathology	Chemical			otometer,
Laboratory	Pathology	2		• Flame
	Laboratory	FORTE		photomete
3.6 List vital				r
automated	Explain vital	<b>O</b>		
Chemical	automated	<b>-</b>		
Pathology	Chemical			
Laboratory	Pathology			
equipment	Laboratory			
	equipment			
3.7 List	7,			
advantages and	Explain advantages			
disadvantages	and			
of automation	disadvantages			

		1		T	T	T
	in Chemical	of automation in				
	Pathology	Chemical			$\mathcal{A}_{\lambda}$	
	Laboratory	Pathology				
		Laboratory			~ <b>&gt;</b>	
GENER.	AL OBJECTIVE 4.0: K	now Blood Chemistr	У			
7-8	4.1 Define Blood	Explain blood	Lecture notes			
			Pictures			
	4.2 List the	Explain the	Charts	<b>Y</b>		
	composition of	composition of	Books			
	blood	blood	Journals	CALER		
			Computer			
	4.3 Explain the	Explain the	Projector			
	functions of	functions of	DVD/Multime			
	blood	blood	dia Player			
			Whiteboard			
GENER	AL OBJECTIVE 5.0: K	now Urine and Stool	Analysis			
9-10	5.1 Define Urine	Explain Urine	Lecture notes	Perform urine	Guide students	Urine sample
			Pictures	analysis to	to:	Reagents
	5.2 Define urinalysis	Explain urinalysis	Charts	Identify normal and		Stool sample
	•		Books	abnormal	Perform urine	Reagents
	5.3 List the normal and	Explain normal and	Journals	constituents of urine	analysis to	
		abnormal			Identify normal	
	constituents of	constituents of	Computer	Perform estimation	and abnormal	
	urine	urine	•	of proteins in urine	constituents of	
		$\mathcal{O}'$	Projector	-	urine	
	5.4 Explain how to	Explain how to	3	Perform stool		
	detect abnormal	detect abnormal	DVD/Multime	analysis to detect	Perform	

constituents in	constituents in	dia Player	occult blood	and estimation of
	urine (reducing	•	faecal fat	proteins in urine
·	sugars, proteins,	Whiteboard/M	raccar rat	proteins in arme
		arker		Perform stool
	ketone bodies,	arker		analysis to
	blood, etc)			detect occult
blood, etc)	blood, ctc)			blood and faecal
5.5 Describe stool	Explain stool and		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	fat
	stool analysis			
5.6 Explain stool	stoor anarysis			
	Explain the			
1	clinical	٠		
	importance of	FORTE		
	urine analysis			
	(recognition of			
1 -	glucosuria,			
	albuminuria,	<b>~</b>		
, ,	etc)	<b>7</b>		
albuminuria,	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	<b>Y</b>		
	Explain the			
	clinical			
	importance of			
	stool analysis			
	(Occult Blood,			
stool analysis	Fecal fats)			
(Occult Blood,				
Feacal fats)				

GENER	AL OBJECTIVE 6.0: K	now anticoagulants i	n Chemical Path	nology	$\stackrel{\checkmark}{\sim}$	
11-12	6.1 Define	Explain the	Lecture notes	Identify	Guide students	Anticoagulant
	anticoagulants	anticoagulants	Pictures	anticoagulants used	to:	s containers
			Charts	in Chemical		Centrifuge
	6.2 Describe the mode	1		Pathology <		Plain
	of action for	of action for	Journals	Laboratory		containers
	anticoagulants in	anticoagulants	Computer		used in Chemical	_
	Chemical Pathology	in Chemical	Projector		$\mathcal{O}_{\mathcal{I}}$	Whole blood
		Pathology		Perform Separation	-	sample
	6.3 List the different			of serum and plasma		
	1 • 1	Explain the	Whiteboard/M	from whole blood		
	anticoagulants used		arker ~		Perform	
	in Chemical	of			Separation of	
	Pathology	anticoagulants	Y		serum and	
		used in	2		plasma from	
	6.4 Describe the	Chemical	$\sim$ $\circ$		whole blood	
	composition of	Pathology	<b>X</b>			
	anticoagulants used					
	in Chemical	Explain the				
	Pathology	composition of				
		anticoagulants				
	6.5 Describe the	used in				
	Separation of	Chemical				
	serum and	Pathology				
	plasma from	$\mathbf{O}^{\prime}$				
	whole blood	Explain the				
		Separation of				

	6.6 Explain the difference between serum and plasma  AL OBJECTIVE 7.0: K	serum and plasma from whole blood Explain the difference between serum and plasma	ation agents and	ED1	n-free Filtrate	
13-14	<ul><li>7.1 Define protein precipitants</li><li>7.2 List the different types of protein precipitants</li><li>7.3 Discuss the</li></ul>	Explain protein precipitants  Explain the different types of protein precipitants  Explain the preparation of	Lecture notes Pictures Charts Books Journals Computer Projector DVD/Multimed ia Player	Prepare Protein-free Filtrate		Protein solution Glass wares Centrifuge Whatman filter paper Funnel Protein precipitants
		Explain specimens in Chemical	Lecture notes Pictures	Collect blood sample using	Pathology Guide students to:	Tourniquets specimen
	8.2 Describe the methods for the Collection of	Pathology  Explain the  methods for the	Charts Books Journals	different methods  Identify different blood preservatives	Collect blood sample using different	containers, syringes and needles, Dry and wet

specimens in	Collection of	Computer		methods 📣	cotton swabs
-		_	Dungamya aallaatad		
Chemical Pathology	specimens in		Preserve collected		Reagents and
	Chemical		_	Identify different	Chemicals
8.3 Define preservation	Pathology		preservatives	blood	
and preservatives		DVD/Multime	, <	preservatives	
	Explain	dia Player			
8.4 List preservatives	preservation and	-		Preserve	
used for specimens	preservatives	Whiteboard/M		collected blood	
in Chemical		arker		using	
Pathology	Explain			preservatives	
	preservatives used				
8.5 Explain why	for specimens in	<u>ئر</u>			
specimens may be	Chemical		<b>)</b>		
preserved in	Pathology				
Chemical Pathology	8,	N. A.			
	Explain why				
	specimens may be	<b>~</b>			
	preserved in	<b>7</b>			
	Chemical ?	$\mathcal{S}$			
	Pathology				

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COURSE TITLE: MEDICAL	COURSE CODE: MLT 215	CONTACT HOURS: 3						
PARASITOLOGY AND ENTOMOLOGY I								
YEAR: II SEMESTER: I	CREDIT UNIT: 3	THEORETICAL: 2						
	PREREQUISITE:	PRACTICAL: 1						
COURSE SPECIFICATION: THEORY AND								
GOAL: This course is designed to provide	students with the basic knowledge an	d skill of Medical Parasitology and						
Entomology								
GENERAL OBJECTIVES: On completion of	this course, the student should be able t	to:						
1.0Know Medical Parasitology								
2.0Know the collection, transportation, process		S.						
3.0Know how to prepare reagent for examination	on of parasites							
4.0Know the principles and application of direct and concentration techniques.								
5.0Know how to Perform routine parasitological Examination on clinical specimen								
6.0Know Medical Entomology	<b>*</b> ***********************************							

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY									
		L PARASITOLOGY C	DE: MLT 215	CONTACT HOUR	S: 3				
AND EN	NTOMOLOGY I	$\overline{\mathbf{C}}$	REDIT UNIT	: 3	THEORETICAL: 2				
YEAR:	II SEMESTER: I	PI	RE-REQUISI	TE: ]	PRACTICAL: 1				
COURS	E SPECIFICATION:	THEORETICAL AND	PRACTICA	L	$\sim$				
GOAL:	This course is design	ed to provide students	with the ba	sic knowledge and	skill of Medical I	Parasitology and			
Entomol	logy	-							
GENER	ALOBJECTIVE 1.0: I	Know Medical Parasitol	ogy.						
THEO	RETICAL CONTENT			PRACTICAL CON	NTENT				
Week	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources			
1-2	Parasitology 1.3.List human parasites of Medical importance 1.4.Explain the classification of	Explain parasitology  Explain Medical  Parasitology  Explain human  parasites of Medical  importance  Explain the  classification of  parasites	Multimedia Projector Screen, Internet Textbooks Computer Journals						

Characteristics of 1.4  1.6 List specimen for parasitological	Explain the Characteristics of 1.4  Explain specimen for parasitological examination  Know the collection, tra	nsportation		ervation of clinical sa	umnles
<ul> <li>3-4</li> <li>2.1Define the following:</li> <li>Specimen collection</li> <li>Transportation</li> <li>Processing</li> <li>Preservation of clinical specimen</li> </ul>	Explain the following  • Specimen collection • Transportation • Processing • Preservation of clinical specimen  Explain the types of specimen collection, transportation, processing, preservation of clinical specimen	Textbooks Internet Journals Video clips Projectors	Identify Specimen containers  Demonstrate the preparation of specimen containers  Illustrate specimen collection  Demonstrate how specimen are transported  Illustrate the processing and preservation of specimen	Guide students to: Identify Specimen containers  Demonstrate the	Containers Microscope Transport medium Needle and Syringe Lancet Centrifuge Glasswares

	2.3Explain the	Explain the challenges			CATION	
	challenges in	in specimen			$\mathbf{v}_{\lambda}$	
	specimen	collection,				
	collection,	transportation,				
	transportation,	processing,				
	processing,	preservation of				
	preservation of	clinical specimen			<b>Y</b>	
	clinical specimen					
CENTED	AL ODJECTIVE 2.0	77 1				
		Know how to prepare r				
5-6	3.1 Explain	Explain reagent			r Guide students to:	Reagents
	reagent for	for Examination		examination c	-	Glassware
	Examination of	of specimen for	Journals	specimen fo		Reagent
	specimen for	parasites	_	Parasites	for examination of	
	parasites		clips		-	Weighing
		List reagents for	Projectors		Parasites	balance
	3.2 List reagents	Examination of	<b>, ,</b> ,			Water distiller
	for Examination	specimen for	•			Spatula
	of specimen for	parasites				
	parasites					
		Explain the uses				
	3.3 Explain the	of reagents for				
	uses of reagents	examination of				
	for examination	specimen for				
	of specimen for	Parasites				
	Parasites	<b>&gt;</b> '				
		Explain the				

	preparation of reagent for examination of specimen for Parasites	preparation of reagent for examination of specimen for Parasites			OCATION	
		Know the principles and		of direct and concent	tration techniques	
7-8	principle of direct techniques in the examination of specimen for Parasites  4.2 Explain the principle of	Explain the principle of direct techniques in the examination of specimen for Parasites  Explain the principle of concentration techniques in the examination of specimen for Parasites	Textbooks Internet Journals Video clips Projectors			
GENER		Know how to Perform r	outine parasi	tological Examinatio	n on clinical specim	en
		Explain routine parasitological	Textbooks	Perform		Microscope Centrifuge
	parasitological examination.	examination.	Journals	examination on	parasitological	Reagents Glassware

	5.2 Define	Explain clinical specimen	clips Projectors		clinical specimen	Reagent bottles Weighing
	clinical specimen	Explain how to				balance
	5.3 Explain how	perform routine				Water distiller
	to perform	parasitological				Spatula
	routine	examination on			)	
	parasitological examination on	clinical specimen		ALTIN ALTIN		
	clinical specimen	Explain the				
	_	identification of				
	5.4 Explain the	parasites in				
	identification of	clinical specimen	<b>\$</b>	O <sub>x</sub>		
	parasites in					
	clinical specimen	Explain the	2			
		features for	$\nabla O_{\lambda}$			
	5.5 List the	identification of	X			
	features for	parasites in	)			
	identification of	clinical specimen				
	parasites in					
	clinical specimen					
		Know Medical Entomol			T	1
11-15	6.1 Define	Explain		•		Magnifying
	Entomology and	Entomology and			Identify Insects	
	Medical	Medical	Journals		causing ill health	Sweep net
	Entomology	Entomology	Video			Bottles
			clips			Trap nets

6.2 Explain the	Explain the	Projectors		<u> </u>	Petri dish
history of	history of Medical				
Medical	Entomology				
Entomology					
	Explain the				
6.3 Explain the	importance of				
importance of	Medical				
Medical	Entomology		Y		
Entomology					
	Explain insects				
6.4 List insects	causing ill health				
causing ill health					
			O <sub>x</sub>		

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COURSE CODE: MLT 216	CONTACT HOURS: 45							
CREDIT UNITS: 2	THEORETICAL: 2							
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							
PRE-REQUISITE: 126	PRACTICAL: 1							
	COURSE CODE: MLT 216 CREDIT UNITS: 2							

GOAL: This course is designed to enable students acquire basic knowledge of Laboratory Management, Organization and Ethics

GENERAL OBJECTIVES: On completion of this course, the students should be able to:

- 1.0 Know Organogram of Medical Laboratory services
- 2.0 Know Standard Operating Procedures (SOPs) in Medical Laboratory Practice
- 3.0 Understand Occupational Health and Safety
- 4.0 Understand Medical Laboratory Hazard, Waste, Biosafety and Biosecurity
- 5.0 Know Medical Laboratory Clients, Services and Satisfaction
- 6.0 Know Storage of Samples and Reagents
- 7.0 Understand International Standard Organization and Accreditation Bodies
- 8.0 Understand the challenges of Medical Laboratory Practice in Nigeria

<b>PROG</b>	PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COUR	RSE TITLE: INTR	ODUCTION TO	COURSE CO	DDE: MLT 216	CONTÂCT HOUR	S: 45			
MEDIO	CAL LABORATORY	MANAGEMENT	, CREDIT UN	IT: 3	THEORETICAL: 2	,			
ORGA	NIZATION & ETHICS I			4	10°				
YEAR	: II SEMESTER: I		PRE-REQUI	SITE: 126	PRACTICAL: 1				
COUR	SE SPECIFIFCATION: 7	THEORETICAL A	ND PRACTIC	AL 🔷	)				
GOAL	: This course is designed to	o enable students ga	in knowledge o	of Management, Orgai	nization and Ethics	during practice			
	ical laboratory practice		_						
GENE	RAL OBJECTIVE 1.0: K	now Organogram o	of Medical Lab	oratory Department					
THEO	RETICAL CONTENT		PRACTI	CAL CONTENT					
Week	Specific Learning	Week	Specific	Week	Specific	Week			
	Outcome		Learning 📈		Learning				
			Outcome 🔨	Y	Outcome				
1-2	1.1 Explain the	Explain the	Multimedia	Appreciate	the Guide studen	ts			
	hierarchy and	hierarchy and	Projector '	organogram of	the to:	Organogra			
	organizational	organizationa	Screen,	Medical Laborate	ory Appreciate th	ne m			
	structure of medical	l structure of 🔇	Internet	Department		of			
	laboratory	medical	Textbooks		the Medic	al			
	department		Computer		Laboratory				
		department	Journals		Department				
	1.2 Explain the role								
	of Medical	Explain the role of							
	Laboratory	Medical							
	Technician in a	Caboratory							
	medical laboratory	Technician in a							
	department	medical							

		L .							
		laboratory							
		department				$\bigvee_{\lambda}$			
	ERAL OBJECTIVE 2.0: 1	Know Standard Op	erating Procedu	ires (SOPs) i					
3-4	2.1 Explain	Explain	Multimedia	Develop	hypothetical	Guidé stu	dents	Sample	
	Standard Operating	Standard	Projector	SOPs		to:		SOPs	
	Procedures (SOPs)	Operating	Screen,			Develop		Sample	Job
	in Medical	Procedures	Internet	Develop	hypothetical	hypothetical	1	Aids	
	Laboratory Practice	(SOPs) in	Textbooks	Job Aids		SOPs			
		Medical	Computer	_					
	2.2 Explain types of	Laboratory	Journals	Compare	SOPs and Job	Develop			
	SOPs in Medical	Practice		Aids		hypothetical	l Job		
	Laboratory Practice					Aids			
	<ul> <li>Management</li> </ul>								
	SOPs	Explain types				Compare	SOPs		
	<ul><li>Testing SOPs</li></ul>	of SOPs in	2	<b>Y</b>		and Job Aid	ls		
	8	Medical							
	2.3Explain the	Laboratory	FOR						
	development of	Practice							
	SOPs	•Manage							
		ment (							
	2.4 Explain the	SOR							
	storage of SOPs	<ul><li>Testing</li></ul>							
	5.61.050 61 2 61 2	✓ 8OPs							
	2.5 Explain Job	Ar sin							
	Aids in Medical	Explain the							
	Laboratory Practice	development							
		of SOPs							
L		1	I			I.			

	2.6 Explain the				$\Delta$	
	_	Explain the		CHALEDIA CALEDIA		
		storage of				
		SOPs				
		Explain Job				
		Aids in				
		Medical				
		Laboratory				
		Practice				
		Explain the				
		difference		O <sub>2</sub>		
		between SOPs				
		and Job Aids	2,			
GENE	RAL OBJECTIVE 3.0: U	nderstand Occupati	onal Health and	d Safety		
5-6	3.1 Define	Explain	Multimedia			
	Occupational health	Occupational	Projector			
	and safety in	health and safety	Screen,			
	Medical Laboratory	in Medical	Internet			
	Practice	Laboratory	Textbooks			
		Practice	Computer			
	3.2Explain		Journals			
		Explain				
		impórtance of				
		Occupational				
	Medical Laboratory	health and safety				

	Practice	in Medica	1			
	1 140400	Laboratory	*			
		Practice				
GENE	RAL OBJECTIVE 4.0: U		l Laboratory Ha	zard, Waste, Biosafety a	nd Biosecurity	l
	4.1 Explain Medical		l Multimedia	Segregate Medical	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Safety Box
	Laboratory Hazards	Laboratory	Projector	Laboratory waste	to:	Colour code
		Hazards	Screen,		Segregate	Waste Bins
	4.2 Explain Medical		Internet		Medical	Model
	Laboratory	Explain	Textbooks	1	Laboratory	Incinerator
	Biosafety and	Medical	Computer	( · \.	waste	Autoclave
	Biosecurity	Laboratory	Journals			PPEs
		Biosafety and			Dispose Medical	
	4.3 Explain Medical	Biosecurity		O	Laboratory	
	Laboratory waste	Explain Medica	1		waste	
	4.4 Explain	Laboratory waste	2,		appropriately	
	segregation and					
	disposal of medical	Explain				
	laboratory	segregation and	1			
	hazardous waste	disposal	r			
		medical				
		laboratory				
		hazardous waste				
GENE	RAL OBJECTIVE 5.0: K	now Medical Laboratery	oratory Services	, Clients and Satisfaction	I .	<u> </u>
	5.1 Explain Medical	Explain	Multimedia	,		
	Laboratory Service	Medical	Projector			
		Laboratory	Screen,			
	5.2 Explain Medical	Service	Internet			

Laboratory Clientale		Textbooks			
Laboratory Clientele	Evaloin Modio			ATION	
5 2 Frantsia Madical	_	Computer			
5.3 Explain Medical	Laboratory	Journals			
Laboratory Client's	Clientele				
services and				<b>\</b> \'	
satisfaction	Explain Medical				
	Laboratory				
	Client's services		<b>Y Y Y Y</b>		
	and satisfaction				
GENERAL OBJECTIVE 6.0: K	Inow Storage of San	nples and Reag	ents		
11-12 6.1 Define Store and	Explain Store	Multimedia	Identify methods of	Guide students	Sample
Storage	and Storage	Projector	storage of samples	to:	storage
		Screen,	and reagents	Identify	documents
6.2 Define storage of		Internet	<b>Y</b> -	methods of	
samples and	Explain	Textbooks	Identify Storage	storage of	Storage
reagents	storage of	Computer	Facilities in	samples and	Facilities
	samples and	Journals	Medical Laboratory	reagents	
6.3 Explain methods	reagents		Practice		
of storage of				Identify	
samples and	Explain		Complete Inventory	Storage	
reagents	methods of		documents	Facilities in	
	storage of			Medical	
6.4 Explain storage	samples and			Laboratory	
facilities in Medical	reagents			Practice	
Laboratory Practice					
	Explain			Complete	
6.5 Explain	storage			Inventory	

inventory	facilities in			documents
management	Medical			
techniques in	Laboratory			
Medical Laboratory	Practice		در	
Practice				
•FIFO	Explain			
•FEFO	inventory			
	management		Y	
6.6 Explain	techniques in		MCALEDO	
inventory	Medical			
documentation in	Laboratory			
medical laboratory	Practice			
practice	•FIFO	$\sim$	Ų'	
	•FEFO		<b>Y</b>	
GENERAL OBJECTIVE 7.0: U			Organization and Accredit	tation Bodies
7.1 Explain the	_	Multimedia		
specific roles of	_	Projector		
various	of various	Screen,		
stakeholders:		Internet		
•Federal and	• Federal	Textbooks		
States MOH		Computer		
• MLSCN	States	Journals		
•SON	MÓH			
●ISO	MLSCN			
•IFBLS	•SON			
•WHO	•ISO			
	•IFBLS			

7.2Explain accreditation check list in Medical Laboratory Practice	•WHO  Explain accreditation check list in Medical Laboratory Practice			ATION
GENERALOBJECTIVE 8.0: U1	nderstand the challe	enges of Medica	l Laboratory Practice in	Nigeria
14-15 8.1 Explain the challenges associated with medical laboratory Practice in Nigeria	1	Projector Screen,		to:

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY									
COURSE TITLE: RESEARCH	COURSE CODE: MLT 217	CONTACT HOURS: 2							
METHODOLOGY IN MEDICAL	CREDIT UNITS: 2	THEORETICAL:2							
LABORATORY TECHNOLOGY									
YEAR: II SEMESTER: I	PRE-REQUISITE:	PRACTICAL: NIL							
GOAL: This course is designed to equip students									
GENERAL OBJECTIVES: On completion of this	s course, the students should be ab	ole to:							
1.0 Understand the concept of research									
2.0 Know the design and planning of the research									
3.0 Understand sampling techniques									
4.0 Know the use of statistics in research									
5.0 Understand the conduct and presentation of re	search results								
6.0 Know the layout of a research report									
O.O Know the rayout of a research report									
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PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COURSE TITLI		H COURSE CODE: ML	T 217 CON'	TACT HOURS	S: 2			
METHODOLOGY	IN MEDICA	L CREDIT UNIT: 2	THE	RETICAL: 2				
LABORATORY SCIENCE	<u> </u>			<i>)</i> •				
YEAR: II SEMESTER:		PRE-REQUISITE:	RRAC	CTICAL: NIL				
COURSE SPECIFICATIO								
GOAL: This course is desi			arch skills to prese	nt research out	comes logically.			
GENERAL OBJECTIVE 1	.0: Understand the con	cept of research						
THEORETICAL CONTE	NT	_ <	PRÁCTICAL CO	ONTENT				
Week Specific Learnin	g Teacher's Activities	Resources	Specific	Teacher's	Resources			
Outcome			Learning	Activities				
			Outcome					
1-3 1.1 Define	Explain	<ul> <li>Textbooks.</li> </ul>						
research.	research.	<ul> <li>Whiteboard/Marker</li> </ul>						
1.2Explain the								
types of	Explain the	<ul> <li>Multimedia</li> </ul>						
research:	types of	projector/Laptops.						
Historical	research:	Internet.						
Descriptive	• Historical	<ul> <li>Lecture notes.</li> </ul>						
Analytical	<ul> <li>Descriptive</li> </ul>	• Charts.						
Experimental								
e.t.c	<ul> <li>Expérimental</li> </ul>							
1.3 Explain the	e.t.c							
aims of								
research.	Explain the aims							
1.4 Define research	of research.							

		т	1		
methodology.				~	
1.5Explain the	Explain research			<b>40</b> )	
methods of	methodology.				
conducting			~ \	<b>&gt;</b>	
research:	Explain the			<i>y</i>	
<ul><li>Experiment</li></ul>	methods of				
al	conducting				
	research:		Y		
1.6 Explain how to	<ul><li>Experiment</li></ul>		CALEDIC		
identify a field of	al	<u> </u>	(C)		
research					
1.7 Explain how to	Explain how to		<b>,</b>		
formulate a	identify a field of	OF OR TECH			
research title.	research				
		2			
1.8 Describe the	Explain how to				
sources of	formulate a				
relevant	research title.				
Information in					
	Explain the sources \( \)	<b>Y</b>			
<ul> <li>Museums</li> </ul>	of relevant				
<ul><li>Markets</li></ul>	Information in				
<ul> <li>Hospitals</li> </ul>	the research field				
<ul> <li>libraries</li> </ul>	<ul> <li>Museums</li> </ul>				
• Internet, etc.	Markets				
1.9 Explain index	Hospitals				
card system for	• libraries				

	how to review related literature on the subject matter of research	• Internet, etc.  Explain index card system for research title  Explain how to review related literature on the subject matter of		CALEDIC	ATION	
CENTE		research	1 1			
		): Know the design an	,			
4-5	2.1 Explain research design.	Explain research design.	<ul><li> Journals.</li><li> Whiteboard/Marke</li></ul>			
	<ul> <li>2.2 Explain methods applied in research design e.g.</li> <li>Intervention</li> <li>non-intervention studies,</li> <li>questionnaire,</li> <li>interview,</li> <li>home visits</li> <li>observation</li> </ul>	<ul> <li>applied in research design e.g.</li> <li>Intervention</li> <li>non-intervention studies,</li> </ul>	<ul> <li>Multimedia projector/laptops.</li> <li>Internet.</li> <li>Lecture notes.</li> <li>Charts.</li> </ul>			

in 4.2. characteristics of each of the tests suitability of each of the tests in 4.2. Explain the suitability of each of the tests in 4.2.  GENERAL OBJECTIVE 5.0: Understand the conduct and presentation of research results  10-12 5.1Explain how to carry out the research experiment using  out the research experiment using  whiteboard/Mar ker	GENE 8-9	3.4 Explain how to calculate the sample size or population appropriate to your research.	Explain how to calculate the sample size or population appropriate to your research.  D: Know the use of state Explain basic statistics  Explain basic statistical tests.  Explain the	<ul> <li>tistics in research</li> <li>Journals.</li> <li>Whiteboard/Marke</li></ul>		
description of the tests in 4.2.  GENERAL OBJECTIVE 5.0: Understand the conduct and presentation of research results  10-12   5.1Explain how to   Explain how to carry   out the research   out the researc		4.4 Explain the suitability of each of the tests	each of the tests in 4.2.			
10-12 5.1Explain how to Explain how to carry carry out the carry out the search whiteboard/Mar			the tests in 4.2.			
carry out the out the research • Whiteboard/Mar	GENE	RAL OBJECTIVE 5.0	0: Understand the cond	duct and presentation of	research results	
was and	10-12	_ <del>-</del>	1 -	• Journals		 
research experiment using ker				• Whiteboard/Mar		
		research	experiment using	ker		

experiment using any research	any research design	Multimedia		
	design	projector/laptops		
design 5.2 Explain how to collect data for the experiment in 5.1 5.3 Explain how to analyze the data using appropriate methods 5.4 Explain how to interpret the results obtained from the research 5.5 Explain how to write up the report of the research	5.1  Explain how to analyze the data using appropriate methods  Explain how to	• Internet • Lecture notes • Charts		
conducted	up the report of the	<b>Y</b>		
	research conducted			
	Y			
GENERAL OBJECTIVE 6.	0: Know the layout of	a research report	 	
13-15 6.1Define research	Explain the research	• Journals.		
report layout	report layout	Whiteboard/Marke		
6.2 List research		r.		
report layout		Multimedia.		

<ul><li>projector/laptops.</li><li>Internet.</li></ul>	
<ul><li>Lecture notes.</li><li>Charts.</li></ul>	

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## YEAR II SEMESTER II

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COURSE	TITLE:	MEDICAL	COURSE CODE: MLT 221	CONTACT HOURS: 45				
MICROBIO	LOGY II		CREDIT UNITS: 3	THEORETICAL: 2				
YEAR: II	SEMESTER: II		PRE-REQUISITE: MLT 211	PRACTICAL: 1				
T LA IIV. II	BEWESTER: II		TRE REQUISITE: MET 211	Title HeriE. 1				

GOAL: To provide students with basic knowledge and skills in Medical Microbiology

GENERALOBJECTIVE: at the end of this course the student should be able to:

- 1.0 Know the historical development Mycology
- 2.0: Understand Culture Media used for Fungi Identification
- 3.0: Understand Immunity to fungal infection
- 4.0: Understand Antigen-Antibody Reactions
- 5.0: Understand the principles and techniques of serological tests in medical microbiology
- 6.0 Understand the quality control in medical microbiology

					( ) ×	
PROG	RAMME: NATIONA	AL DIPLOMA (ND) I	MEDICAL L	ABORATORY TE	CHNOLOGY	
COUR	SE TITLE:	MEDICAL	COURSE COI	DE: MLT 221	CONTACT HOU	JRS: 45
MICR(	OBIOLOGY II	C	CREDIT UNIT	Γ: 3	THEORETICAL	: 2
YEAR:	II SEMESTER: II	F	RE-REQUIS	ITE: MLT 211	RACTICAL: 1	
COUR	SE SPECIFICATION:	THEORETICAL AN	D PRACTICA	AL 💮		
GOAL:	To provide students	with basic knowledge	and skills in M	ledical Microbiology	у	
GENE	RAL OBJECTIVE 1.0	: Know the historical of	development N	Mycology:		
THEC	RETICAL CONTEN	Γ		PRACTICAL CON	NTENT	
Week	Specific Learning	Teacher's Activities	Resources	Specific Learning	Teacher's	Resources
	Outcome			Outcome	Activities	
			· · · · · · · · · · · · · · · · · · ·			
1-2	1.1 Define mycology	Define mycology	Multimedia			
			Projector			
	1.2 Explain historical	-	Sèreen,			
	development of	development of	Intérnet			
	mycology	mycology	Textbooks			
			Computer			
	1.3Explain	Explain	Flip charts			
	Classification of	Classification of	Journals			
	fungi base on;	fungi base on;				
	Morphology	Morphology				
	•Life cycle	Life cycle				
	•Production	<ul><li>Production</li></ul>				
	of spore	of spore				

	•Nutrition	•Nutrition				À	
	1.4 Explain the	Explain the					
	Morphology of	Morphology of					
	fungi	fungi			<b>4</b>		
	1.5 Explain the general characteristics of medically important fungi	Explain the general characteristics of medically important fungi				JCATION	
GENE	RAL OBJECTIVE 2.0:	Understand Culture M	edia used for	Fungi Identi	fication		•
3-4	2.1. List culture	Explain culture	Multimedia	Prepare	culture	Guide student to	Microscope
	media for the	media for the	Projector >	media for	fungal	Prepare culture	Reagents
	identification of	identification of	Screen,	specimen		media for fungal	Centrifuge
	fungi	fungi	Internet			specimen	Incubator
	2.2 Explain the		Textbooks				Culture media
	types of culture	Explain the types	Computer				Autoclave
	media for fungi	of culture media	Flip charts				Weighing
	identification	for fungi	Journals				balance
	<ul> <li>Sabouraud</li> </ul>	identification	Glass wares				Petri dishes
	Dextrose	<ul> <li>Sabouraud</li> </ul>					Hot air Oven
	Agar	Dextrose					Boiling water
	(SDA)	Agar					bath
	• Potato	(SDA)					Glasswares
	Dextrose <	<ul><li>Potato</li></ul>					Slides
	Agar	Dextrose					Wire loops

	T	T	T		4	
	(PDA)	Agar				Spatula
	<ul><li>Brain Heart</li></ul>	(PDA)			$\Delta O_{\lambda}$	
	Infusion	<ul><li>Brain Heart</li></ul>				
	Agar	Infusion				
	(BHIA)	Agar		4		
	•Corn meal	(BHIA)			$\circ$	
	Agar	•Corn meal				
	(CMA)	Agar		Y		
		(CMA)				
	3.3 Explain the					
	preparation for	Explain the				
	fungi	preparation for				
	culture media	fungi	$\sim$	O'		
		culture media				
CENEI	L DAL ORIECTIVE 2 0:	Understand Immunity	to functinf	action		
5-6		l V	Multimedia	CCHOII		
3-0	3.1 Define Immunity					
	3.2 Explain different	Evaloin different	Projector			
	types of immunity;	-	Screen,			
	Innate and acquired	types of immunity;	Internet Textbooks			
	immunity 3.3 Differentiate	Innate and acquired				
		immunity  Differentiate between	Computer Flip charts			
	between 5.2	2 2	-			
			Journals			
CENIEI	LAL ODIECTIVE 4 &	Indonstand Antican A	ntibody Door			
		Understand Antigen-A		CHOUS		
7-8	4. 1 Define Antigen	_	Multimedia			
	Antibody reactions	Antibody reactions	Projector			

		G		<u> </u>	
407					
1					
	Antibody reactions				
		-			
	1	-			
4.3 Explain the		Journals		$\circ$	
properties of	Antibody reactions	Microscope			
Antigen-Antibody		slides,	Y		
reactions		Specimen			
	Explain Principle and	slide and			
	application of;	stains			
4.4 Explain Principle	<ul> <li>Agglutination</li> </ul>				
and application of;			O <sub>k</sub>		
<ul> <li>Agglutination</li> </ul>	_				
		Q, Y			
1	Touchon	OF			
	· Understand the princi	nles and tech	niques of serological	tests in medical mic	robiology
IMIL ODJECTIVE 5.0	, Onderstand the princip	pies and teem	inques of scrological	tests in medical line.	robiology
5.1 Define	Explain serological	Multimedia			
		v			
		Internet			
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				
(		-			
5.3 Explain the		-			
	Antigen-Antibody reactions  4.3 Explain the properties of Antigen-Antibody reactions  4.4 Explain Principle and application of;  • Agglutination • Precipitation • Flocculation reaction  RAL OBJECTIVE 5.0  5.1 Define serological test in medical microbiology 5.2 List serological test in medical microbiology	Antigen-Antibody reactions  4.3 Explain the properties of Antigen-Antibody reactions  4.4 Explain Principle and application of;  • Agglutination • Precipitation • Precipitation • Flocculation reaction  RAL OBJECTIVE 5.0; Understand the principle serological test in medical microbiology  5.1 Define serological test in medical microbiology  5.2 List serological test in medical microbiology  List serological test in medical microbiology	Antigen-Antibody reactions reactions  Antibody reactions  Explain the properties of Antigen-Antibody reactions  Antibody reactions  Explain the properties of Antigen-Antibody reactions  Antibody reactions  Antibody reactions  Antibody reactions  Flip charts  Journals  Microscope slides, Specimen  Specimen  Explain Principle and application of;  Agglutination Precipitation Flocculation reaction  Flocculation reaction  Explain serological test in medical microbiology  5.2 List serological test in medical microbiology  Explain serological test in medical microbiology  List serological test in medical microbiology  Textbooks  Computer  Flip charts  Microscope slides, Specimen  Slide and stains  Antibody reactions  Microscope slides, Specimen  Stains  Explain serological test in medical microbiology  List serological test in medical microbiology  Figure 1  Textbooks  Computer  Flip charts  Computer  Flip charts	4.2 List types of Antigen-Antibody reactions  Antigen-Antibody reactions  4.3 Explain the properties of Antigen-Antibody reactions  4.4 Explain Principle and application of;  Agglutination Precipitation Precipitation Flocculation reaction  RAL OBJECTIVE 5.0; Understand the principle and compute the serological test in medical microbiology  5.2 List serological test in medical microbiology  Antibody reactions  Explain the properties of Antigen-Flip charts  Of Antigen-Antibody reactions  Antibody reactions  Antibody reactions  Antibody reactions  Flip charts  Journals  Microscope slides, Specimen slide and stains  Precipitation Precipitation Flocculation reaction  Explain Principle and application of; Precipitation Flocculation reaction  Explain serological test in medical microbiology  Screen, Internet Textbooks  Computer  Flip charts	4.2 List types of Antigen-Antibody reactions  4.3 Explain the properties of Antigen-Antibody reactions  4.4 Explain Principle and application of;  • Agglutination • Precipitation • Precipitation • Flocculation reaction  RAL OBJECTIVE 5.0; Understand the principles and describing as serological test in medical microbiology  5.1 Define serological test in medical microbiology  5.2 List serological test in medical microbiology  microbiology  List types of Antigen-Antibody reactions  Antibody reactions  Microscope slides, Specimen slide and stains  Antibody reactions  Microscope slides, Specimen slide and stains  Flocculation reaction  Multimedia Projector  Screen, Internet  Textbooks  Computer  Flip charts  Muttimedia Projector  Screen, Internet  Textbooks  Computer  Flip charts  Multimedia Projector  Screen, Internet  Textbooks  Computer  Flip charts

	principles and techniques of;  • Widal  • VDRL  • Latex agglutination	and techniques of;  • Widal  • VDRL  • Latex agglutination			JCATION	
GENE	RAL OBJECTIVE 6.0:	Understand the quality	y control in m	edical microbiology		
	6.1 Define Quality control	Explain Quality control	Multimedia Projector Screen,	AICH.		
	control in medical microbiology 6.3 Explain types of quality control in	Explain quality control in medical microbiology Explain types of quality control in medical microbiology	Internet Textbooks Computer Flip charts Journals			
	6.3 Explain merits and demerits of quality control in medical microbiology	Explain merits and demerits of quality control in medical microbiology				

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COURSE TITLE: HISTOPATHOLOGY	COURSE CODE: MLT 222	CONTACT HOURS: 3						
AND CYTOLOGY II	CREDIT UNITS: 3	THEORETICAL: 2						
YEAR: II SEMESTER: II	PRE-REQUISITE: MLT 212	PRACTICAL: 1						
GOAL: This course is designed to provide stu	dents with the knowledge and skills	of Histopathology and Cytology.						
GENERAL OBJECTIVES: On completion of this course, the students should be able to:								
1.0. Know staining technique in Histopatholog	У							
2.0. Know staining techniques in Cytology								

3.0. Understand museum techniques in Histopathology.

PROG	RAMME: NATIONAL	L DIPLOMA (ND) MI	EDICAL LA	BORATORY TEC	CHNOLOGY	
COUR	SE TITLE: HISTOP	ATHOLOGY AND CO	OURSE COL	DE: MLT 222	CONTACT HOURS	: 3
CYTOL	LOGY II	Cl	REDIT UNIT	Γ: 3	ΓΗΕΟRETICAL: 2	
YEAR:	II SEMESTER: II	PI	RE-REQUIS	TE: MLT 212	RACTICAL: 1	
COURS	SE SPECIFICATION:	THEORETICAL AND	PRACTICA	L 🕠	)	
GOAL:	This course is designed	l to provide students wi	th the knowle	edge and skills of his	stopathology and Cyt	tology.
		Know staining technique	e in Histopatl			
THEO	RETICAL CONTENT			PRACTICĂL CON	NTENT	
Week	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources
1-5	1.1Define Stain and Staining in Histopathology and Cytology 1.2 List Histological Staining Techniques 1.3 Explain Histological Staining Techniques 1.4 Explain the principles, uses, merits and	Histopathology and Cytology Explain Histological Staining Techniques Explain Histological	Projector Screen, Internet Textbooks Computer Flip charts Journals	Identify Staining Apparatus. Perform:  • H and E staining.  • PAS staining  • Masson's Trichrome Staining.  • Perl's Prussian blue	<ul> <li>Perform: <ul> <li>H and E staining.</li> </ul> </li> <li>PAS staining</li> <li>Masson's Trichrome Staining.</li> </ul>	Stains Tissue slides Staining racks Reagents Video clips Slide racks

	T			
Explain the		staining.	blue 💫	
procedures for		O'1 D 1 \O 2	staining.	
each staining		• Oil Red O'	010 110	
Techniques in		• Von Gieson's	Of Red O'	
Histopathology			Von	
Explain the		staming ?		
procedures for				
each staining		Y	Staning	
Techniques in				
Histopathology				
Explain:				
	$\sim$	O'		
•		<i>&gt;</i>		
11	2			
Hydration.	COL			
Differentiation	<b>)</b>			
Blueing.				
Counterstaining				
• Dehydration.				
Creasing.				
• Solvents.				
	procedures for each staining Techniques in Histopathology Explain the procedures for each staining Techniques in Histopathology  Explain:	procedures for each staining Techniques in Histopathology Explain the procedures for each staining Techniques in Histopathology  Explain:  • Deparaffinizatio n  • Hydration.  • Differentiation  • Blueing.  • Counterstaining  • Dehydration.  • Creasing.	procedures for each staining Techniques in Histopathology Explain the procedures for each staining Techniques in Histopathology  Explain:  Deparaffinizatio n  Hydration.  Blueing.  Counterstaining  Dehydration.  Creasing.	procedures for each staining Techniques in Histopathology Explain the procedures for each staining Techniques in Histopathology Explain:  Deparaffinization Hydration.  Differentiation Blueing. Counterstaining Pethydration. Creasing.

<ul> <li>Solvents.</li> <li>Mordants.</li> <li>1.8 Explain Mountin and Mountants</li> <li>GENERAL OBJECTIVE 2.0</li> </ul>			ZV .	CATION	
6-10  2.1List staining techniques in cytology 2.2 Explain staining techniques in cytology 2.3 Explain the principles, uses, merits and demerit of each staining techniques in 2.1 2.4 List the procedures for each staining Techniques in cytology 2.5 Explain the procedures for each staining Techniques in cytology 2.5 Explain the procedures for each staining Techniques in cytology	Explain staining techniques in cytology Explain staining techniques in cytology Explain the principles, uses, merits and demerits of each	Multimedia Projector Screen, Internet Textbooks Computer	Identify simple stains Perform	Identify simple stains Perform:      Gram's staining      Ziehl Nelson staining      Giemsa staining	Stains Tissue slides Staining racks Reagents Video clips Slide racks

	cytology		
GENE		Understand Museum T	Technique in Histopathology
11-15	3.1. Define	Explain Museum	Multimedia
	Museum	Explain	Projector
	3.2 Explain	Histopathology	Screen,
	Histopatholog	Museum.	Internet
	y Museum.	Explain the	Textbooks Computer Flip charts Journals
	3.3. Explain the	Historical	Computer
	Historical	development of	Flip charts
	development	Histopathology	Journals
	of	Museum	Glass wares
	Histopatholog	Explain the types	
	y Museum	of specimens	
	3.4. List the	typically found in	
	types of	histopathology	
	specimens	museums.	
	typically	Explain the	
	found in	chemicals for	
	histopathology	Preservation of	
	museums.	tissues for the	
	3.5 List the	Museum.	
	chemicals for	Explain mounting	
	Preservation	and preservation	
	of tissues for	of Slides	
	the Museum.	Explain storage	
	3.6 Explain	and preservation	
	mounting and	techniques in	

preservation of Slides 3.7. Explain storage and preservation techniques in	Histopathology Museums. Explain Cataloging and Documentation. Explain the role
Histopathology	of digital
Museums.	Technology in
3.8. Explain	Histopathology
Cataloging and	Museums.
Documentation.	Explain Maintenance
3.9. Explain the	and Management of
role of digital	Histopathology
Technology in	Museums.
Histopathology	
Museums.	
3.10. Explain	
Maintenance and	
Management of	
Histopathology	
Museums.	

EVALUATION: CA 40%
EXAMINATION 60%

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COURSE TITLE: HEAMATOLOGY AND	COURSE CODE: MLT 223	CONTACT HOURS: 3						
BLOOD GROUP SEROLOGY II	CREDIT UNITS: 3	THEORETICAL: 2						
YEAR: II SEMESTER: II	PRE-REQUISITE: MLT 213	PRACTICAL: 1						
COAL This are in the large than 1 and 1	24. 4 1	1 1 D1 1 C						

GOAL: This course is designed to provide students with the basic knowledge and skills in Haematology and Blood Group Serology

GENERAL OBJECTIVES: On completion of this course, the students should be able to:

- 1.0Know Basic Haematological Techniques
- 2.0Understand Anaemia
- 3.0Understand Staining Techniques in Haematology
- 4.0Know Basic Serologiacal Techniques
- 5.0Understand Blood Transfusion Science

PROGI	PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COURS	SE TITLE: HEA	MATOLOGY ANI	COURSE	CODE: MLT 223	CONTACT HOURS	: 3			
BLOOD	GROUP SEROLOG	GY II	CREDIT U	UNIT: 3	THEORETICAL: 2				
YEAR:	II SEMESTER: II		PRE-REQ	UISITE: MLT 213	PRACTICAL: 1				
COURS	E SPECIFICATION	: THEORETICAL A	ND PRACT	ICAL 🔨	$\mathcal{V}$				
GENER	ALOBJECTIVE 1.0	: Know Basic Haemat	ological Tec	hniques	Y				
THEOI	RETICAL CONTEN	T		PRACTICAL CONTE	NT				
Week	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources			
1-3	Haematological Technique  1.2. List Basic Techniques in Haematology	Haematological Technique Explain Basic Techniques in Haematology	Multimedia Projector Screen, Internet Textbooks Computer Plip charts Journals	Perform:      ESR     PCV     WBC Count	Guide students to: Perform:  • ESR  • PCV  • WBC Count	Slides Cover slip Blood sample syringe and needle EDTA bottles Capillary tube Cotton wool			
	Erythrocyte sedimentation rate (ESR)  1.4. Explain	Explain Erythrocyte sedimentation rate (ESR)  Explain Packed Cell Volume		<ul> <li>RBC Count</li> <li>Prepare blood films</li> <li>Perform Haemoglobin</li> <li>Estimation using</li> </ul>	RBC Count	Western green tubes and rack Haematocrit Centrifuge and reader Neubauer Counting			
	Volume	(PCV).			2	chamber			

	(PCV).			Drabkins Solution	Estimation using	Sahli pipet
	(1 C V ).	Explain Full		Diadkins Solution	Drabkins Solution	Reagents
	1.5 Explain	Blood Count.				Microscope
	Full Blood					1
	Count.	Explain Bood				
		Film Making				
	1.7. Explain				$\mathcal{Y}$	
	Bood Film	Explain		Y		
	Making	Haemoglobin				
		Estimation.		S. CHIMICALLY		
	1.8 Explain					
	Haemoglobin	List the				
	Estimation.	different				
		methods of Hb	·	<b>Y</b>		
	1.9. List the	estimation	2	,		
	different		$\sim O_{\lambda}$			
	methods of Hb	Explain Sickling	A TOP OF THE PROPERTY OF THE P			
	estimation	Test.	$\circ$			
	1 10 5 1 1		7			
	1.10. Explain					
GEV VED	Sickling Test.		•			
		0: Understand Anaem		Γ		1
4-6	2.1 Define	Explain	Multimedia			
	Anaemia	Anaemia	Projector			
			Screen,			
	2.2. List the	Explain the	Internet			
	classification 🔨	classification of	Textbooks			

	of anaemia.	anaemia.	Computer		JCATION	
			Flip charts		<b>1 1 1 1 1 1 1 1 1 1</b>	
	2.3 Explain:	Explain the	Journals			
	• Reference	following terms.				
	range.	Reference				
	• Absolute	range.			$\triangleright$	
	values.	Absolute			7	
		values.		Y		
	2.4. Explain	Explain				
	Haematologica	Haematological				
	I Indexes.	Indexes				
GENER	RAL OBJECTIVE 3.0	1: Understand Staining	g Techniques	in Haematology		
7-9	3.1 Define	Explain Staining	Multimedia	Perform Staining	Guide students to:	
	Staining in	in Haematology	Projector	techniques on blood	Perform Staining	Blood sample
	Haematology		Screen,	film.	techniques on blood	Reagents
		Explain Staining	Internet		film	PPE
	3.2 List	Techniques in	Textbooks			
	Staining	Haematology -	Computer			
	Techniques in		Flip charts			
	Haematology	Explain the principles and	Journals			
	3.3 Explain the	use of each				
	principles and	Staining				
	use of each	Technique in				
	Staining	Haematology				
	Technique in	<b>,</b> ,				
	Haematology	Explain merits				

	3.4 Explain merits and demerits of each staining technique in haematology  3.5 List haematological stains	and demerits of each staining technique in haematology  Explain haematological stains			CALE	JCATION .	
		0: Know Basic Serolo				T	
10-12	4.1 Define	Explain ABO	Multimedia	Perfo		Guide students to	Syringe and
	ABO Blood	1	Projector (	V	Direct blood	Perform:	needle
	Grouping	System.	Screen,	ĺ	grouping		Blood
	System.		Internet			<ul> <li>Direct blood</li> </ul>	collection tube
		Explain the	Textbooks	•	Indirect blood	grouping	Hand Gloves
	4.2. Explain	principle of	Computer		grouping.		Alcohol swab
	ABO Blood	ABO blood	Klip charts			<ul> <li>Indirect</li> </ul>	Antisera A,B,
	Grouping	grouping.	Journals	•	Rh blood	blood	AB and D
	System.				grouping	grouping.	Whole Blood
		Explain the					sample.
		formation of				Rh blood	Stop watch
	4.3. Explain	ABO antigens.				grouping	Tile
	the formation						Micro titration
	of ABO						plate
	antigens.	Explain the					Test Tubes

	principle of			
4.4. Explain	ABO blood			
the principle of	grouping.			
ABO blood	grouping.			
grouping.	List types of			
grouping.	ABO blood			
4.5. List types	grouping.			
of ABO blood	grouping.		\ \tag{\chi}'	
grouping.	Explain Rhesus			
S. o. pg.	Blood Grouping			
4.6 Define	System.			
Rhesus Blood				
Grouping				
System.	Explain the			
	clinical	DFOR		
4.7 Explain	implications of	$\sim$		
Rhesus Blood	ABO and Rh			
Grouping	blood grouping.			
System.				
	Explain the	<b>Y</b>		
4.8. Explain	challenges of			
the clinical	ABO and Rh			
implications of	Grouping			
ABO and Rh	Systems.			
blood				
grouping.				

	1		T			1
	4.9. Explain					
	the challenges				$\Delta O_{\lambda}$	
	of ABO and				TION	
	Rh Grouping					
	Systems.					
GENER	AL OBJECTIVE 5.	0: Understand Blood	Transfusion S	cience.		
13-15	5.1. Define	Explain Blood	Multimedia	Y		
	Blood	Transfusion	Projector			
	Transfusion	Science.	Screen,			
	Science.		Internet			
		Explain the	Textbooks			
	5.2. Explain	History of	Computer			
	Blood	Blood Banking.	Flip charts •			
	Transfusion		Journals 🔨	<b>Y</b>		
	Science.	Explain blood				
		donation				
	5.3. Explain	criteria.				
	the History of					
	Blood	Explain types of				
	Banking.	blood donation				
		Y				
	5.4. List blood	Explain				
	donation	anticoagulants				
	criteria.	used in blood				
		banking.				
	5.5. Explain					

blood donation	Explain Blood			4	
criteria.	collection and			10>	
	storage for				
5.6. List types	transfusion.				
of blood	Explain				
donation	Anticoagulants			$\sim$	
	used in blood			P	
5.7. List	banking.		Y		
anticoagulants					
used in blood					
banking.					
5.8. Explain					
Blood		•			
collection and		2			
storage for					
transfusion.					

**EVALUATION: CA 40% EXAMINATION 60%** 

PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY							
COURSE TITLE: CHEMICAL PATHOLOGY II	COURSE CODE: MLT 224	CONTACT HOURS: 3					
	CREDIT UNITS: 3	THEORÉTICAL: 2					
YEAR: II SEMESTER: II	PRE-REQUISITE: MLT 214	PRACTICAL: 1					
GOAL: This course is designed to provide students	with the basic knowledge and	kill in Chemical Pathology					
GENERAL OBJECTIVES: On completion of this completion.	ourse, the students should be ab	le to:					
1.0Know the concept of metabolism of glucose							
2.0Know Plasma proteins and their methods of esting							
3.0Understand Cholesterol and its methods of estim	ation						
4.0Know the electrolytes and trace elements							
5.0Understand Formation of Bilirubin and its metho							
6.0Know the Functions of kidney and Renal Function Tests							
7.0Know the Basic Functions of selected enzymes and their methods of estimation							
8.0Know the basic Quality Control in Chemical Patl	hology						

<b>PROG</b>	PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY								
COUR	COURSE TITLE: CHEMICAL PATHOLOGY II COURSE CODE: MLT 224 CONTACT HOURS: 3								
	CREDIT UNIT: 3 THEORETICAL: 2								
YEAR:	II SEMESTER: II	Pl	RE-REQUIS	ITE: MLT 214	PRACTICAL: 1				
COUR	SE SPECIFICATION: T	THEORETICAL AND	PRACTICA	L					
GOAL:	: This course is designed	l to provide students w	ith the basic	knowledge and skill	in Chemical Patholog	gy			
GENE	RAL OBJECTIVE 1.0: K	Know the concept of m	etabolism of	glucose	/				
THEC	RETICAL CONTENT			PRACTICAL CON	TENT				
Week	Specific Learning	Teacher's Activities	Resources	Specific Learning	Teacher's	Resources			
	Outcome			Outcome	Activities				
1-2	1.1 Explain metabolism	Explain metabolism	Lecture	Perform blood gluco		Specimen,			
	of glucose	of glucose		estimation and gluco					
				tolerance test	glucose	Colorimeter,			
		Explain renal	Charts		estimation and	Spectrophoto			
	threshold of glucose	threshold of glucose	Books		glucose	meter,			
	1 2 1 :-4 M-41 1- f	D	Journals		tolerance test	Centrifuge			
	1.3 List Methods for the estimation of	Describe Methods for the estimation	Computer			PH Meter Water Bath			
	blood glucose	blood glucose	Computer			water Datii			
	blood glucosc	blood glucose	Projector						
	1.4 Discuss the	Explain the	Trojector						
	Principles, merits and	1 -	DVD/Mult						
	demerits of each		imedia						
			Player						
		Glucose estimation							
		r	Whiteboard						

	1 5 5 1 1 1	D 1 ' 1	/A # 1		_	
	1.5 Explain glucose	Explain glucose	/Marker			
	tolerance test	tolerance test			$\Delta O_{\lambda}$	
	1.6 Discuss the					
	clinical	Explain the clinical		بـم		
	importance of	importance of blood				
	blood glucose	glucose estimation			ATION	
	estimation and	and glucose tolerance				
	glucose tolerance	test				
	test					
GENE	RAL OBJECTIVE 2.0: 1	Know Plasma proteins	and their me	thods of estimation.		
3-4	2.1 Define Plasma	Explain Plasma			Guide students	Specimen,
	proteins	proteins	notes	Protein estimation	to:	reagents,
			Pictures 🖍	O		Colorimeter,
	2.2 List the functions of	Explain the functions	Charts <		Perform serum	Spectrophoto
	Plasma proteins	of Plasma proteins	Books	Perform serum Albumin	Total Protein	meter,
		•	Journals	estimation	estimation	Centrifuge
	2.3 List methods of	Explain methods of				PH Meter
	estimation of Total	estimation of Total	Computer			Water Bath
	Protein and Albumin	Protein and Albumin	1		Perform serum	
			Projector		Albumin	
	2.4 Discuss the	Explain the	3		estimation	
	principles, merits	principles,	DVD/Mult			
	and demerits of		imedia			
	each method for	_ \ \	Player			
	estimation of	method for	5			
	Total Protein	estimation of	Whiteboard			
	\ \ \ \	Total Protein	/Marker			

	b 5 D: 4					
	2.5 Discuss the					
	principles, merits	Explain the				
	and demerits of	principles,				
	each method for	merits and				
	estimation of	demerits of each				
	Albumin	method for				
		estimation of				
	2.6 State reference	Albumin		<b>Y</b>		
	values and					
	clinical	Explain				
	importance of	reference values				
	Total Protein and	and clinical				
	Albumin	importance of		$\bigcup_{\mathbf{y}}$		
	estimation	Total Protein				
		and Albumin	0,			
		estimation				
GENE	RAL OBJECTIVE 3.0: U	Understand Cholestero	and its meth	nods of estimation		
5-6	3.1 Define cholesterol.	Explain cholesterol	Lecture	Perform serum	Guide students	Specimen,
			notes	cholesterol estimation	to Perform	reagents,
	3.2 List methods of	Explain the methods	Pictures		serum	Colorimeter,
	estimation of	of estimation of	Charts		cholesterol	Spectrophoto
	cholesterol	cholesterol	Books		estimation	meter,
			Journals			Centrifuge
	3.3 Discuss	Explain the				PH Meter
	principles,	principles, merits	Computer			Water Bath
	merits and	and demerits of	1			
	demerits of	each method for	Projector			

	each method for	estimation of				
	estimation of	cholesterol	DVD/Multi		AIION	
	cholesterol	Cholesteror	media			
		Explain the reference				
	3.4 State reference	values and	riayei			
		clinical	Whiteboard			
	values and					
	clinical	importance of	/Marker			
	importance of	cholesterol		Y		
	cholesterol	estimation				
	estimation					
	RAL OBJECTIVE 4.0: K				T	1
7-8	4.1 Define electrolytes	Explain electrolytes	Lecture	Perform electrolytes	Guide students	Specimen,
	and trace elements	and trace	notes	Na+, K+ and Cl-)	to	reagents,
		elements	Pictures	estimation		Colorimeter,
	4.2 List the major		Charts		Perform	Spectrophoto
	electrolytes and trace	Explain the functions	Books	Perform Calcium and	electrolytes	meter,
	elements	of the major	Ĵournals	Phosphate estimation	(Na+, K+ and	Centrifuge
		electrolytes and	) ′	_	Cl-) estimation	PH Meter
	4.3 List the functions of	trace elements	Computer		,	Water Bath
	electrolytes and trace				Perform	Flame
	elements	Explain the functions	Projector		Calcium and	Photometer
		of electrolytes and	,		Phosphate	
	4.3 List methods	trace elements	DVD/Mult		estimation	
	for estimation of		imedia			
	electrolytes and	Explain methods	Player			
	trace elements	for estimation of				
		electrolytes and	Whiteboard			

	4.5.1.		0.7.1	Ī	<b>A</b>	1
	4.4 Explain	trace elements	/Marker			
	principles, merit				$\Delta O_{\lambda}$	
	and demerits of	Explain the				
	each method for	principles merit and		_		
	estimation of	demerits of each			) <sup>k</sup>	
	electrolytes and	method for				
	trace elements	estimation of				
	4.4 State reference	electrolytes and trace				
	values and	elements				
	clinical					
	importance of	Explain the reference				
	electrolytes and	values and clinical				
	trace elements	importance of		(C)		
		electrolytes and trace				
		elements estimation	0			
GENE	RAL OBJECTIVE 5.0: U	Inderstand Formation	of Bilitubin a	and its methods of estimate	tion.	
	5.1 Define Bilirubin	Explain Bilirubin and	Lecture	Perform serum bilirubin		Specimen,
	and Bile pigments	Bile pigments	notes	estimation	to Perform	reagents,
			Pictures		serum bilirubin	Colorimeter,
	5.2 Explain the	Explain the	Charts		estimation	Spectrophoto
	Formation of	Formation of	Books			meter,
	Bilirubin and Bile	Bilirubin and Bile	Journals			Centrifuge
	pigments	pigments.				PH Meter
			Computer			Water Bath
	_	Explain the	•			
	5.3 Explain the	principles, merit and	Projector			
	principles,	demerits of each				

	merit and	method for	DVD/Mult			
			imedia			
			Player			
	estimation of			د		
		Explain the reference	Whiteboard	4		
		values and clinical	/Marker			
4	5.4 State reference	importance of				
		bilirubin estimation				
	clinical					
	importance of					
	bilirubin					
	estimation					
GENER	AL OBJECTIVE 6.0: K	now the Functions of		<u> </u>		
11-12	6.1 Describe the	Explain the features	Lecture	Perform serum and	Guide	Specimen,
		and functions of the		′		reagents,
	functions of the	kidneys		Urea, Uric Acid		Colorimeter,
	kidneys			estimation	Perform	Spectrophoto
		Explain the Renal	Books			meter,
(		Function Tests				Centrifuge
	Function Tests				,	PH Meter
		Explain the	Computer		,	Water Bath
(	5.3 Explain	principles, merit and			Acid	
	principles,	demerits of each	Projector		estimation	
	merit and	method for				
	demerits of	estimation of serum	DVD/Mult		Perform	
		and urine Creatinine,			Creatinine	
	estimation of	Urea, Uric Acid.	Player		clearance and	

serum and urine Creatinine, Urea, Uric Acid. 6.4 Explain the principles and procedures for Creatinine clearance and urea clearance	Explain the principles and procedures of methods for estimation of Creatinine clearance and urea clearance.	Whiteboard /Marker			
GENERAL OBJECTIVE 7.0: I	Know the Basic Function	ons of selecte	d enzymes and their met	hods of estimation	1
13-14 7.1 Define enzymes	Explain enzymes	Lecture 🗘	Perform estimation of:	Guide students	Specimen,
		notes		to	reagents,
1	Explain the	Pictures	<ul> <li>Alkaline</li> </ul>		Colorimeter,
_	commonly estimated	Charts	Phosphatase		Spectrophoto
Chemical Pathology	enzymes in Chemical		<ul> <li>Acid Phosphatase,</li> </ul>		meter,
	Pathology	Journals	<ul> <li>Amylase</li> </ul>		Centrifuge
7.3 Describe the		1	• AST	1 11114111110	PH Meter
sources and functions	_	Computer	• ALT	I	Water Bath
of the enzymes:	and functions of the			• Acid	
• Alkaline	enzymes:	Projector		Phosphatase,	
Phosphatase	<ul> <li>Alkaline</li> </ul>			<ul> <li>Amylase</li> </ul>	
Acid Phosphatase,	Phosphatase	DVD/Mult		• AST	
• Amylase	Acid	imedia		• ALT	
• AST		Player			
• ALT	<ul> <li>Amylase</li> </ul>				

	• AST	Whiteboard	
7.3 Explain the	• ALT	Marker Marker	
general			
principles,	Explain the		
procedures and	general		
methods for	principles,		
estimation of:	procedures and		
<ul> <li>Alkaline</li> </ul>	methods for		
Phosphatase	estimation of:		
<ul> <li>Acid Phosphatase,</li> </ul>	<ul> <li>Alkaline</li> </ul>		
<ul> <li>Amylase</li> </ul>	Phosphatase		
• AST	• Acid		
• ALT	Phosphatase,		
7.4 Explain the	<ul> <li>Amylase</li> </ul>		
clinical	• AST		
importance of	• ALT		
estimation of:			
<ul> <li>Alkaline</li> </ul>	Explain the		
Phosphatase	clinical		
<ul> <li>Acid Phosphatase,</li> </ul>	importance of		
<ul> <li>Amylase</li> </ul>	estimation of:		
• AST	• Alkaline		
• ALT	Phosphatase		
	Acid		
	Phosphatase,		
	• Amylase		
	• AST		

		. ATT				
		• ALT				
GENE	RAL OBJECTIVE 8.0: k	Know the basic Quality	Control in C	Chemical Pathology.		1
15	8.1 Define Quality	Explain Quality	Lecture	Prepare Quality Control	Guide students	Charts
	Control in Chemical	Control in	notes	charts (e.g. Levey	to Prepare	Graph sheets
	Pathology	Chemical	Pictures	Jennings chart)	Quality Control	Ruler
		Pathology	Charts		charts	Pencil
			Books			Quality
	8.2 List the importance	Explain the	Journals			Control
	of Quality Control in	importance of				Values
	Chemical Pathology	Quality Control in	Computer			
		Chemical				
		Pathology	Projector	O		
	0.2 E1-i	E1-: 41	DVD/M-1			
	-	Explain the use of	DVD/Mult			
	Quality Control charts (e.g. Levey	Quality Control charts (e.g. Levey	imedia /			
	Jennings chart) in	Jennings chart)in	Ployer			
	Chemical Pathology	,	Whiteboard			
	Chemical Famology	Chemical Famology	/Marker			
			/ IVIAI KEI			

EVALUATION: CA 40% EXAMINATION 60%

PROGRAMME: NATIONAL DIPLOMA (N	D) MEDICAL LABORATORY	Y TECHNOLOGY
COURSE TITLE: MEDICAL	COURSE CODE: MLT 225	CONTACT HOURS: 3
PARASITOLOGY AND ENTOMOLOGY II		
	CREDIT UNIT: 3	THEORETICAL: 2
YEAR: II SEMESTER: II	PRE-REQUISITE: MLT 215	PRACTICAL: 1
COURSE SPECIFICATION: THEORY AND F	PRACTICALS	<b>Y</b>
GOAL: This course is designed to provide st	udents with the basic knowleds	ge and skill of Medical Parasitology and
Entomology		
GENERAL OBJECTIVE: On completion of the	is course, the student should be a	able to:
1.0Know the basic life cycle of Protozoa and He	elminthes	
2.0Know the Laboratory diagnosis of parasitic is	nfections	
3.0Know the methods for the control of parasition	c infections 🔾	
4.0Know the life cycle of common Insects of M	edical Importance	
5.0Understand the methods for the control of art		
AATIONALBO		
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PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LA						
COURSE TITLE: MEDICAL PARASITOLOGY AND			COURSE CODE: MLT 225, CONTACT HOURS: 3			
ENTOM	IOLOGY II			CREDIT UNIT: 3	THEO	RETICAL: 2
YEAR:	II SEMESTER: II			PRE-REQUISITE:	PRAC'	TICAL: 1
COURS	E SPECIFICATION: TH	HEORETICAL AND P	RACTICAL		O <sup>r</sup>	
GOAL:	This course is designed to	o provide students with	the basic known	owledge and skill of M	edical Parasitol	ogy and
Entomo	logy	_				
GENER	ALOBJECTIVE 1.0: Kn	ow the basic life cycle	of Protozoa a	nd Helminthes		
THEOR	ETICAL CONTENT			PRACTICAL CONT	ENT	
Week	Specific Learning	Teacher's Activities	Resources	Specific Learning	Teacher's	Evaluation
	Outcome			Outcome	Activities	
1-3	1.1 Explain the basic	Explain the basic life	Textbooks	O <sub>Y</sub>		
	life cycle:	cycle of	Whiteboard	<b>}</b>		
	<ul> <li>Amoeba</li> </ul>	<ul> <li>Amoeba</li> </ul>	Marker			
	<ul> <li>Flagellates</li> </ul>	<ul> <li>Flagellates</li> </ul>	Multimedia			
	<ul> <li>Cilliates</li> </ul>	• Cilliates	projector			
	<ul> <li>Sporozoa</li> </ul>	Sporozoa	Lecture			
	-		notes			
	1.2 Explain the basic	Explain the basic life				
	life cycle of Cestodes	cycle of Cestodes				
	<ul> <li>Taenia species</li> </ul>	<ul> <li>Taenia species</li> </ul>				
	<ul> <li>Echinococcus</li> </ul>	• Echinococcus				
	species	species				
	1.3 Explain the life	Explain the life cycle				
	cycle of Trematodes	of Trematodes				
	• Schistosoma	<ul> <li>Schistosoma</li> </ul>				

	species	species				
	_	*				
CENED	• Lung flukes	• Lung flukes		manitia infantiana		
	AL OBJECTIVES 2.0: I				( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	h e:
4-6	2.1 List the	Explain the		Identify reagents for the	Guide students	-
	reagents for the	reagents for the		diagnosis of:	to:	Video clips
	diagnosis of	diagnosis of	Whitebo			Atlas
	intestinal	intestinal	ard	• intestinal	<i>-</i>	Glasswares
	parasites	parasites	Marker	parasites	reagents for the	Centrifuge
			Multime	<ul><li>Urinary</li></ul>	diagnosis of:	
	2.2 List reagents	Explain reagents	dia	parasites		
	for the	for the diagnosis	projector	Haemoparasites	• intestinal	
	diagnosis of	of urinary	Lecture		parasites	
	urinary	parasites	notes	Examine samples for:	<ul> <li>Urinary</li> </ul>	
	parasites			_	parasites	
		Explain the		• intestinal	• Haemoparasi	
	2.3 List the	reagents for the	$\sim O_{\lambda}$	parasites	tes	
	reagents for the	diagnosis of	<b>S</b>	<ul><li>Urinary parasites</li></ul>		
	diagnosis of	haemoparasites	•	<ul> <li>Haemoparasites</li> </ul>	Examine	
	haemoparasites			Tracinoparasites	samples for:	
		Explain the		Report results		
	2.4 Explain the	diagnostic		rtoport resurts	• intestinal	
	diagnostic	methods for			parasites	
	methods for	• intestinal			• Urinary	
	<ul><li>intestinal</li></ul>	parasites			parasites	
	parasites	Urinary			• Haemop	
	• Urinary	parasites			arasites	
	parasites	Haemoparasites			arusites	

	• Haemoparasites	Explain the reporting pattern		Report results
	2.5 Explain the	of the		
	reporting	examination		
	pattern of the			
	examination			
GENERA.	AL OBJECTIVE 3.0 Km	now the methods for the	control of pa	rasitic infections.
7-9	3.1 Explain the	Explain the	Textbooks	
	methods for the	methods for the	Whiteboard	
	control of:	control of:	Marker	
	<ul><li>Intestinal</li></ul>	<ul><li>Intestinal</li></ul>	Multimedia	
	parasites	parasites	projector	
	●Urinary	<ul><li>Urinary</li></ul>	Lecture	
	parasites	parasites	notes	
	<ul> <li>Haemoparasites</li> </ul>	<ul> <li>Haemoparasites</li> </ul>		
GENERA.	AL OBJECTIVE 4.0 Km	ow the life cycle of con	mon Insects	of Medical Importance
10-12	4.1 Define life	1 1	Textbooks	
	cycle in	in Entomology 💛	Whiteboard	
	Entomology		Marker	
		Explain the life	Multimedia	
	4.2 Explain the life	cycle of insects	projector	
	cycle of insects		Lecture	
		Explain vectors	notes	
	4.3 Explain vectors			
	<b>\</b>	Explain the role of		
	4.4 Explain the role	vectors in the life		
	of vectors in the	cycle of insects		

	life cycle of insects		
GENER.	AL OBJECTIVE 5.0 Un	derstand the methods fo	or the control of Arthropods
13-15	5.1 Explain the	Explain the	Textboo
	methods for the	methods for the	ks
	control of	control of	Whitebo
	Arthropods	Arthropods	ard
			Marker
	5.2 Explain the	Explain the	Multime
	methods for the	methods for the	dia
	control of Insects	control of Insects	projector
	and Arachnids	and Arachnids	Lecture
			notes

EVALUATION: CA 40% EXAMINATION 60%

PROGRAMME: NATIONAL DIPLOMA (ND) M	EDICAL LABORATORY T	ECHNOLOGY
<b>COURSE TITLE:</b> INTRODUCTION T	O COURSE CODE: MLT 226	CONTACT HOURS: 2
IMMUNOLOGY AND VIROLOGY	CREDIT UNIT: 2	THEORETICAL: 2
YEAR: II SEMESTER: II	PRE-REQUISITE:	PRACTICAL: NIL

COURSE SPECIFIFCATION: THEORETICAL

GOAL: This course is designed to provide students with the basic knowledge of Immunology and Virology

#### **GENERAL OBJECTIVE**

- 1.0 Understand the concept of immunity and immunization.
- 2.0 Understand the nature of the immune system
- 3.0 Understand the basic structure and classifications of virus of medical importance
- 4.0 Understand the antigen-antibody and allergic reactions
- 5.0 Understand the interaction between virus and the host imprine system
- 6.0 Understand the collection, transport and storage of samples for viral studies

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<b>PROG</b>	PROGRAMME: NATIONAL DIPLOMA (ND) MEDICAL LABORATORY TECHNOLOGY					
COUR	SE TITLE:	INTRODUCTION	TOCOURS	SE CODE: ML7	T 226 CONTACT	FHOURS: 2
IMMU]	NOLOGY AND VIR	OLOGY	CREDI	T UNIT: 2	THEORET	TCAL: 2
YEAR:	II SEMESTER: II		PRE-RI	EQUISITE:	PRACTICA	AL: NIL
COURS	SE SPECIFIFCATION	N: THEORETICAL				
GOAL:	This course is design	ed to provide students	s with the bas	sic knowledge o	of Immunology ar	nd Virology
Genera	l Objective 1.0: Under	rstand the concept of i	immunity an			
THEO	RETICAL CONTEN'	Γ		PRACTICAL	CONTENT	
Week	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources
1-2	<ul> <li>1.1 Define the following terms: <ul> <li>immunology</li> <li>immunity</li> <li>immunization</li> </ul> </li> <li>1.2 Explain method of acquiring immunity</li> <li>1.3 explain the factors</li> </ul>	following terms:         • immunology         • immunity         • immunization  Explain method of acquiring immunity	Multimedia White Board/Mak er Board, Rrojector, Reference books, Posters, Charts, Computer			

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immunity			<u> </u>	<i>y</i>
explain the				
<del>*</del>				
-		_		
			$\mathcal{Y}$	
Explain the		( )X	,	
_				
List common	· ·	<b>,</b>		
	\$O'			
discuses in Tylgeria	<b>O Y</b>			
Dafina:				
_				
_				
schedules in Nigeria				
<b>X</b> •				
	importance of immunization  Explain the mechanism of infection  List common communicable diseases in Nigeria  Define:  • epidemics,  • endemics  • pandemics,	explain the importance of immunization  Explain the mechanism of infection  List common communicable diseases in Nigeria  Define:  • epidemics, • endemics • pandemics,  Explain immunization	explain the importance of immunization  Explain the mechanism of infection  List common communicable diseases in Nigeria  Define:  • epidemics, • endemics • pandefnics,  Explain immunization	explain the importance of immunization  Explain the mechanism of infection  List common communicable diseases in Nigeria  Define:  • epidemics, • endemics, • pandemics, • pan

	Nicorio					
	Nigeria					7
GENI	ERAL OBJECTIVE 2.	0: Understand the natu	re of the imr	nune system		$\mathbf{S}'$
3-6	2.1Define Immune	Evaloia Immuno	Multimedia	<u> </u>		<u>'</u>
3-0		Explain Immune	White			
	system	system				
	2.2 list types of		Board/Mak			
	immune system	list types of immune				
	2.3 State the	system	Projector,		$\rightarrow$	
	components and		Reference			
	characteristics of	State the	books,			
	2.2 above	components and	Posters,			
		characteristics of 2.2	Charts,			
	2.4 Define:	above	Computer			
				<b>Y</b>		
	<ul><li>antigen,</li></ul>	Explain:		-		
	<ul><li>antibody</li></ul>		CO'			
		<ul><li>antigen,</li></ul>				
	2.5 Describe the	• antibody				
	basic structure of					
	antibodies.					
		Describe the basic				
	2.6 List the classes	structure of				
	of antibodies.	antibodies.				
	or unitio odies.					
	2.7Explain natural					
	and artificial	List the classes of				
	immunity	antibodies.				
	Illilluliity	announcs.				

						_
		Explain natural and				7
	I .	artificial immunity				) ×
GENE	RAL OBJECTIVE 3.0	): Understand the bas	ic structure and	d classifications	of virus of medic	al
importa	ance	<u>,                                      </u>	<del>,</del>		<u> </u>	
7-9	3.1 Define virus	Explain virus	Multimedia			
			White			
	3.2 List Virus of	Discuss Virus of	Board/Mak			
	medical importance	medical importance	er Board,	4		
			Projector,	<b>→</b>	<b>Y</b>	
	3.3 Explain the	Explain the impact	Reference			
	impact of viruses on		books,			
	_	health.	Posters,			
			Charts,	$\mathcal{L}_{\mathbf{r}}$		
	3.4 Describe Basic	Describe Basic	Computer <			
	structure of a virus	structure of a virus		<b>Y</b>		
	3.5 list the	list the classification				
	classification of	of viruses				
	viruses					
GENER	RAL OBJECTIVE 4.0	: Understand the anti	gen-antibody a	nd allergic react	ions	
10-11	4.1 Explain antigen		Multimedia			
		antibody reactions	White			
	reactions		Board/Mak			
		Explain allergic	er Board,			
	1	reactions	Projector,			
	reactions		Reference			
	4.3 Describe factors	Describe factors	books,			

		affecting antigen-	Posters,			À
	antibody	antibody reactions	Charts,			$\mathcal{O}_{\lambda}$
	reactions		Computer			<b>Y</b>
GENE	RAL OBJECTIVE 5.	0: Understand the inte	eraction betwo	een virus and the l	host immune syste	em
12-13	5.1 Explain the	Explain the				
	mechanism of	mechanism of viral		,	N. P.	
	viral entry and	entry and spread			<b>V</b>	
	spread within the	within the host			<b>Y</b>	
	host					
		Explain host				
	5.2. Explain host	immune response to				
	immune response	viral infection				
	to viral infection			<b>Y</b>		
		Explain immune				
	_	invasion strategies	<b>~</b>			
	immune invasion strategies by virus	by virus	D,			
	5.4 List techniques	Explain techniques				
	for virus	for virus detection:				
	detection:					
		<ul> <li>microscopy,</li> </ul>				
	<ul> <li>microscopy,</li> </ul>	• culture,				
	• culture,	serology				
	<ul> <li>serology</li> </ul>	• molecular				
	• molecular 🗸	methods				
	methods 💙	<b>Y</b>				

GENEI studies	RAL OBJECTIVE 6.0	): Understand the collection, transport and storage of samples for viral
-	6.1 Explain	Explain collection of
	collection of viral	1 -
	samples	
		Explain
	6.2 Explain	transportation
	transportation	methods of viral
	methods of viral	samples
	samples	
	6.3 Explain the	Explain the storage
	storage of viral samples	of viral samples
	•	Explain the S
	6.4 Explain the	challenges of
	challenges of	collection
	collection	transportation and
	transportation and	storage of viral
	storage of viral	samples
	samples	

EVALUATION: CA 30% EXAMINATION 70%

COURSE	PRACTICAL CONTENTS
troduction to Medical Laboratory	Identify Data in Medical Laboratory
nformation Management System (MLIMS)	Identify sources of Data in Medical Laboratory
ILT 124	Identify Medical Laboratory registers
	Make entry into the Medical Laboratory Registers
	Identify data storage methods
	Identify Data retrieval Methods
	Store Data
	Retrieve Data
	Archive Data
	Identify Document and Records in Medical
	♦ Laboratory
	Classify Medical Laboratory Documents
	Classify Medical Laboratory Records
	Fill Documents
	Manage Records
Medical Laboratory Techniques	• Identify the types of medical laboratory techniques
ALT 125	• Use PPE appropriately
	Demonstrate basic medical laboratory safety
	measures.
	<ul> <li>Apply basic rules and regulations in medical</li> </ul>
	laboratory practice

	<ul> <li>Perform Medical Laboratory tests using the following techniques: <ul> <li>Medical Microbiology</li> <li>Chemical pathology</li> <li>Haematology</li> <li>Histopathology</li> </ul> </li> <li>Identify Simple laboratory wares, equipment and their uses in medical laboratory</li> <li>Perform: <ul> <li>Venipuncture</li> <li>Capillary puncture</li> <li>Arterial</li> </ul> </li> <li>Identify materials for Phlebotomy</li> <li>Perform Specimen collection and processing</li> </ul>
	Perform Macro/ Microscopic examination of specimen
	Perform Culture and sensitivity techniques Perform Specimen collection and processing in Chemical Pathology
ONAL BOL	Perform Chemical examination of blood, urine and stool
AAI	<ul> <li>Perform Blood collection and processing</li> <li>Perform Full blood count (FBC)</li> </ul>
	<ul> <li>Prepare and examine Blood films</li> <li>Perform Specimen collection, preservation and processing in Histopathology</li> </ul>
Introduction to Medical Laboratory	Identify types of laboratory waste

Management, Organization & Ethics I MLT 126	<ul> <li>Identify the steps in laboratory waste management</li> <li>Use PPE appropriately</li> <li>Dispose Laboratory waste</li> <li>Demonstrate Inter and Intra-departmental relationships of personnel in a typical health facility.</li> <li>Organizational Charts</li> <li>Demonstrate how to maintain and care for laboratory equipment</li> </ul>
Medical Microbiology I MLT 211	<ul> <li>Draw the structure of bacterial cell</li> <li>Identify Microbiological examination techniques</li> <li>Prepare culture plates</li> <li>Perform the following techniques:         <ul> <li>Microscopy</li> <li>Culture</li> <li>Biochemical tests</li> <li>Sensitivity</li> </ul> </li> <li>Perform:         <ul> <li>Cultivation</li> <li>Isolation</li> <li>Preservation</li> <li>of bacteria in the laboratory</li> </ul> </li> </ul>
Hispathology and Cytology I MLT 212	<ul><li>Prepare fixatives</li><li>Perform Tissue Processing</li></ul>
WILL ZIZ	<ul> <li>Perform Tissue Processing</li> <li>Prepare decalcifying fluids.</li> </ul>

	<ul> <li>Perform the decalcification of a Bone Tissue specimen</li> <li>Determine the end point of decalcification</li> <li>Demonstrate Tissue processing</li> <li>Perform Embedding</li> <li>Prepare blocks from selected tissue pieces.</li> <li>Identify Microtome parts.</li> <li>Identify Microtome knives</li> <li>Demonstrate Microtomy</li> </ul>
Haematology and Blood Group Serology I MLT 213	<ul> <li>Demonstrate preparation of smears for cytology</li> <li>Prepare anticoagulants</li> <li>Perform blood collection: <ul> <li>Capillary</li> <li>Venous</li> </ul> </li> <li>Identify blood bank equipment</li> </ul>
Chemical Pathology I MLT 214	<ul> <li>Identify the classes and compositions of:         <ul> <li>Carbohydrates (sugars)</li> <li>Proteins</li> <li>Lipids</li> </ul> </li> <li>Identify Chemical Pathology Laboratory         <ul> <li>Equipment</li> </ul> </li> <li>Identify components of:         <ul> <li>Colorimeter,</li> <li>Spectrophotometer,</li> <li>Flame photometer</li> </ul> </li> <li>Use:</li> </ul>

	<ul> <li>Colorimeter,</li> <li>Spectrophotometer,</li> <li>Flame photometer</li> <li>Perform urine analysis to</li> <li>Identify normal and abnormal constituents of urine</li> <li>Perform estimation of proteins in urine</li> <li>Perform stool analysis to detect occult blood and faecal fat</li> <li>Identify anticoagulants used in Chemical Pathology Laboratory</li> <li>Perform Separation of serum and plasma from whole blood</li> <li>Prepare Protein-free Filtrate</li> <li>Collect blood sample using different methods</li> <li>Identify different blood preservatives</li> <li>Preserve collected blood using preservatives</li> </ul>
Medical Parasitology and Entomology I MLT 215	<ul> <li>Identify Specimen containers         <ul> <li>Demonstrate the preparation of specimen containers</li> </ul> </li> <li>Illustrate specimen collection</li> <li>Demonstrate how specimen are transported</li> <li>Illustrate the processing and preservation of specimen</li> <li>Prepare reagents for examination of specimen for Parasites</li> </ul>

Introduction to Medical Laboratory Management, Organisation and Ethics I MLT 216	<ul> <li>Perform parasitological examination on clinical specimen</li> <li>Identify Insects causing ill health</li> <li>Appreciate the organogram of the Medical Laboratory Department</li> <li>Develop hypothetical SOPs</li> <li>Develop hypothetical Job Aids</li> <li>Compare SOPs and Job Aids</li> <li>No Practical Content</li> <li>Segregate Medical Laboratory waste</li> <li>Dispose Medical Laboratory waste appropriately</li> <li>Identify Inethods of storage of samples and reagent</li> <li>Identify Storage Facilities in Medical Laborator Practice</li> <li>Complete Inventory documents</li> <li>Identify the challenges associated with medical laboratory Practice in Nigeria</li> </ul>	
Medical Microbiology II MLT 221	Prepare culture media for fungal specimen	
Hispathology and Cytology II MLT 222	<ul> <li>Identify Staining Apparatus.</li> <li>Perform: <ul> <li>H and E staining.</li> <li>PAS staining</li> <li>Masson's Trichrome Staining.</li> <li>Perl's Prussian blue staining.</li> <li>Oil Red 'O'</li> </ul> </li> </ul>	

	- Von Gieson's staining
	Identify simple stains
	Perform:
	- Gram's staining
	- Ziehl Nelson staining
	- Giemsa staining
	- Papanicolaou staining
	- Wright staining
Haematology and Blood Group Serology II MLT 223	X Perform:
	- ESR
	- PCV
	- WBC Count
	- RBC Count
	Prepare blood films
	• Perform Haemoglobin Estimation using Drabkins
	Solution Solution
	Perform Staining techniques on blood film
	Perform Direct and Indirect Blood Grouping.
	Perform Rh Blood Grouping
Chemical Pathology II	Perform blood glucose estimation and glucose
MLT 224	tolerance test
	Perform serum Total Protein estimation
$\Delta O_{\lambda}$	Perform serum Albumin estimation
	Perform serum cholesterol estimation
	• Perform electrolytes (Na+, K+ and Cl-) estimation
7,	Perform Calcium and Phosphate estimation

	Perform serum bilirubin estimation
	Perform serum and urine Creatinine, Urea, Uric
	Acid estimation
	Perform Creatinine clearance and urea clearance estimation
	Perform estimation of:
	<ul> <li>Alkaline Phosphatase</li> </ul>
	- Acid Phosphatase,
	- Amylase
	- AST
	- ALT
	<ul> <li>Prepare Quality Control charts (e.g. Levey</li> </ul>
	Jennings chart)
Medical Parasitology and Entomology II	<ul> <li>Identify reagents for the diagnosis of:</li> </ul>
MLT 225	intestinal parasites
	Urinary parasites
	- Haemoparasites
	Examine samples for:
	- intestinal parasites
	- Urinary parasites
	- Haemoparasites
	- Report results obtained

### 1. BASIC SCIENCE LABORATORY

- a. Physics Laboratory
- b. Chemistry Laboratory
- c. Biology Laboratory

#### 2 MEDICAL LADODATODY

a. Physic b. Chem c. Biolog	1. BASIC SCIENCE LABORATORY a. Physics Laboratory b. Chemistry Laboratory c. Biology Laboratory			
S/N	ITEMS AND EQUIPMENT	QUANTITY REQUIRED		
1.	Anticoagulants containers	100		
2.	Antiseptic wipes	1 Carton		
3.	Autoclave	5		
4.	Automatic Pipette (Assorted)	5 for each volume range		
5.	Blood bank refrigerator	26.0		
6.	Blood collection tubes	100		
7.	Blood donor's chair	,2"		
8.	Blood Sample containers	100		
9.	Water bath	5		
10.	Bucket Centrifuge (Electronic)	10		
11.	Manual Centrifuge	10		
12.	Bunsen Burner	2 students to 1		
13.	Manual Cabinets/Shelves	5		
14.	Fire Proof Cabinets	2		
15.	Capillary tube	1 carton		
16.	Tissue Cassettes	100		
17.	Chairs (Laboratory Stool)	100		
18.	Colorimeter/Spectrophotometer	5		
19.	Colour code	As required by the section		

20.	Cotton wool	1 carton
21.	Cover slips	50 Packs
22.	Culture media	5 containers for each medium
23.	Decalcifying Fluid	20 litres
24.	Disinfectants	20 litres
25.	EDTA bottles	1 carton
26.	Embedding medium/Paraffin Wax	50kg
27.	Fire Extinguisher and Sand Bucket	2 in each Lab
28.	Fixatives	As required.
29.	Flame photometer	2
30.	Funnel	20
31.	Gas Cylinder (25kg)	3
32.	General register	As needed
33.	Glasswares (Assorted)	Test Tubes(100) and 50 for others
	R	(Measuring cylinders flasks beakers,
	60'	etc)
34.	Grease Marker	5
35.	Haematocrit Centrifuge and Reader	5
36.	Haemoglobinometer	5
37.	Hand Tally Counter	20
38.	Hot air Oven	5
39.	Hot Plate	5
40.	Incubator	5
41.	Lancet	20 packs
42.	Magnifying Lens	20
43.	Microscopes (Bipocular)	2 students to 1 Microscope
44.	Microtomes	2

45.	Microtomes Knives	10
46.	Model Incinerator	1
47.	Improved Neubauer Counting chamber	2 students to 1
48.	Pasture Pipette	200
49.	Petri dish	100
50.	PH Meter	5
51.	Phlebotomy beds	2
52.	Plain containers	1000
53.	Plasma extractor	1
54.	PPEs	As many as required
55.	Protein precipitants	As needed per time
56.	Pipette Filter	20
57.	Protein solution	As Required
58.	Reagent bottles	30
59.	Reagents	As many as required
60.	Chemicals	As many as required
61.	Record books	As Required for each department
62.	Refrigerator	6
63.	Register	As Required for each department
64.	Safety Box	5
65.	Safety Manual	As required in each Lab
66.	Sahli pipette	10
67.	Sample Containers	50
68.	Sample Job Aids	As required for each section
69.	Sample SOPs	As required for each section
70.	Sample storage documents	As required in each Lab
71.	Samples	As needed for each procedure

72.	Slide racks	10
73.	Slides	1 carton
74.	Specimen Containers	As required in each Lab
75.	Staining Racks	50
76.	Stains	As Required
77.	Standard Solutions	As Required
78.	Stool sample Reagents	As Required
79.	Stop Watch/Timer	2 students to 1
80.	Sweep net	10
81.	syringes and needles,	1 carton
82.	Thermometers	50
83.	Tissue Block	As Required
84.	Tissue slides	Kearton
85.	Tissues	As Required
86.	Tools	1 Tool Box
87.	Tourniquets	50
88.	Transport medium	As Required
89.	Trap nets	20
90.	Tripod Stand	20
91.	Urinalysis Kit	10 packs
92.	Urine sample	When needed
93.	Vacutainer	1 Carton
94.	Vacutainer needles and Holder	1 Carton
95.	Voltage Stabilizer	1 per each electrical appliance
96.	Waste Bins	20
97.	Water distiller	2
98.	Weighing balance (Electronic)	5

99.	Weighing Balance (Manual)	5
100.	Western green tubes and rack	1 carton
101.	Whatman filter paper	1 carton
102.	Whole blood sample	As needed
103.	Wire loops	1 per student

# 3. AUDIO-VISUAL AND COMPUTER LABORATORY REQUIREMENTS

S/N	ITEMS	QUANTITY REQUIRED
1.	Atlas	As required in each department
2.	Electronic Cabinets	2
3.	CD ROM	1 Pack
4.	Charts	As required by the section
5.	Cloud	As required
6.	Computers	20
7.	Flash drives	5
8.	Google Drive	1 Terabite
9.	Hard Drive	1 terabite
10.	Internet	Access With Router
11.	Memory Card	5
12.	Organogram	As required
13.	Pictorials	As many as necessary
14.	Text books	As required adequate
15.	Video clips	As required

## LIST OF PARTICIPANTS FOR FINAL CRITIQUE ND MEDICAL LABORATORY TECHNOLOGY

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