



KIST

MEDICAL LABORATORY PROGRAM

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LIST OF ABBREVIATIONS

CLT	Certificate in Medical Laboratory Techniques
MLT	Diploma in Medical Laboratory Technology
BBLT	Bachelor of Bioedical Laboratory Technology
PGDME	Post Graduate Diploma in Medical Education
LWA	Learning working assignments
PEX	Practical Exercises
UAHEB	Uganda Allied Health Examination Board
SEM	Semester
KIST	Kampala Institute of Science and Technology
MOU	Memorandum of Understanding



KAMPALA INSTITUTE OF SCIENCE AND TECHNOLOGY
P.O. Box 14274, Kampala, Uganda
Tel: +256772120046/ +256779837314
Email: kistsecretary@gmail.com
Web: www.kist.ac.ug

THE MEDICAL LABORATORY PROGRAM AT KAMPALA INSTITUTE OF SCIENCE AND TECHNOLOGY (KIST)

Preamble

The program taught is Certificate In Medical Laboratory Techniques (CLT), the registration centre number is UAHEB/154.

The program has so far had two cohorts of graduands of the years of entry 2018 who completed in 2019, cohort 2019 completed in April- 2022 due to effect of COVID-19. Currently there are three cohorts of students; finalists (entrants of March 2021), first years (Feb 2022 intake, now in 2nd semester) and year 1(new entrants).

MINIMUM ENTRY REQUIREMENTS

A minimum of 5 passed subjects at the same sitting of the Uganda Certificate of Education, these include **(4) passes** in Mathematics, Biology, Chemistry, Physics or General science and a **credit** in English language obtained **OR** their equivalent.

No age limit, any successful candidate with a minimum Uganda Certificate of Education with atleast 4 passes in the 3 core science subjects and mathematics, a credit in English.

Academic AWARD

Upon successfully studying for two years (4 Semesters), and passing all the prescribed school based and national examination (conducted at the end of each semester), a **Certificate in Medical Laboratory Techniques** is awarded by UAHEB.

AUTHORISING BODY

The program is taught at Kampala Institute of Science and Technology (KIST) – a private licensed fully tertiary Institution with a licence number **MOES/BTVET/161**.

The program is also registered by the Uganda Allied Health Examination Board (UAHEB) with a centre number **UAHEB/154**.

CAREER PROGRESS

A Medical Laboratory Assistant may progress to **Qualification Level 4**, with an award of the **Diploma in Medical Laboratory Technology (MLT)**.

A Medical Laboratory Assistant may also opt for any of the following Diploma programs at KIST

- *Diploma in pharmacy (3 years)*
- *Diploma in Clinical Medicine and Community Health (3 years)*

QUALIFICATION LEVEL

The qualification level is 3. And upon successfully completing the program, one's cadre title is a **medical laboratory assistant**.

Teaching staff

SN	Name of Medical laboratory Tutor	Academic qualifications	Years of teaching experience	Number of years at KIST
1	KIGGUNDU MOSES	CLT, MLT and BME	15 years	4 years and still present
2	WALAKIRA CLOVIES	BBLT	4 Years	3 years and still present
3	ONORIA EMMANUEL	Dip Educ, BBLT	9 years	2 years and still present
4	MASETE GEORGE	BBLT, PGDMEduc	6 years	1 year and still present
5	SSALI SAMUEL	BBLT, PGDMEduc	3 years	1 year and still present
6	EWOCU PATRICK	BSc (Computer)	6 years	4 years and still present
7	NYAKATO JOSELYN	Entrepreneurship	2 YEARS	2 year and still present

Table 1: Medical lab tutors

STUDY TIME IN THE COURSE OF THE PROGRAM

Module title		Average time	
		Contact (hours)	Weeks
1	Perform GLP	320	8
2	Perform routine parasitological tests	480	12
3	Perform microbiological tests	520	13
4	Perform routine haematological tests	480	12
5	Perform routine clinical chemistry tests	320	8
6	Perform routine blood transfusion tests	200	5
7	Perform routine management and Entrepreneurship	160	4
Total		2480 HOURS	62 WEEKS

Table 2: contact hours of each course module

PLACEMENT & FOLLOW UP OF STUDENTS DURING HOSPITAL ATTACHMENTS

As an institution policy, hospital attachments are a mandatory part of the students training, and this is done after a month of face-face classroom teaching, in which students are inducted on what to be taught and

examined in the semester. This paves way for specific skill acquisition during placement in the various laboratories during hospital attachments.

The schedule for supervision of students, during hospital attachments, by medical laboratory tutors is always available and adhered to, to ensure maximum benefit from these routine clinical attachments.

Each student has a log book (field attachment book) that is filled by the **supervisor** called an assessor (**laboratory technician/technologist/ medical tutor**), during the entire time of placement, depending on the semester content scope. With this record, the quality of hands-on practice is guaranteed.

The log books are also a partial component of the fulfillment of the ward of any medical laboratory certificate/diploma by UAHEB. These are always presented to the board for assessment before the year 2 semester 2 finals commence.

During holidays or semester breaks, students are also given introductory letters to community hospitals where they can gain further clinical experience from.

At the end of the 5 weeks placement, a practical/ performance test is arranged for students at KIST, to ascertain the level of achievement by students. Students are examined in routine tests like gram staining, microscopy, film comments, calorimetry and stool analysis, depending on their scope of training in a given semester.

HOSPITALS OF PLACEMENT FOR LABORATORY STUDENTS

KIST has up-to date MOUs with the following hospitals where students are placed for clinical skills experience along-side teaching.

Hoima Regional Referral Hospital
Mityana General Hospital and Mityana District Health Centres
Kiruuddu National Referral Hospital
Butabika National Referral Hospital
Kawempe National Referral Hospital
Wakiso District Health Centres

Table 3: Hospitals for placement

KEY COMPETENCES / DUTIES OF A MEDICAL LABORATORY ASSISTANT

A competence is what a person can do, after a given time period of training/education.

At KIST we train train Medical Laboratory Assistants to perform but not limited to the **following**;

- **Ensure well planned/ organized laboratory work schedules** through, but not limited to, organizing the laboratory work area, preparation of reagents, prepare items for emergency, organize work schedules and prepare laboratory materials for out-reach tasks.

- **Observe health and environmental safety precautions** through instituting safety signs(where absent), uphold hygiene and safety, recommended good laboratory practice- wearing PPEs, ideal waste segregation and management, decontamination, safe preparation, package and storage of laboratory chemicals, perform first aid and care for fire safety equipment.
- **Collection of specimen for laboratory tests-** through practicing the skill of phlebotomy, having knowledge on preserving and transporting field specimen to diagnostic centres, storing specimen, collecting specimen for culturing.
- **Perform routine parasitological tests-** examine blood for haemoparasites, examine urine for urogenital parasites, examine sputum, examine stool, prepare reagents(stains), fixatives and smears/swabs for parasitological tests.
- **Perform routine microbiological tests-** examine urine for bacteria and fungi, prepare smears and perform gram staining, examine sputum for Acid Fast Bacilli/ lung fluke (*Paragonimus westermani*), examine stool in intestinal helminth infection.
- **Perform routine haematological tests-** through acquainting laboratorians with the skill(s) of preparing anticoagulants, prepare Romanowsky stains (Giemsa, Wright's stain, leishmann stain),
- **Perform ABO, Rhesus grouping and perform compatiability testing and counsel clients on the importance of blood transfusion.**
- **Perform serological tests-** perform Human Chorionic Gonadotrophin(HCG) test, TPHA (*Treponema pallidum Haemoagglutination Test*), BAT, test for *Helicobacter pylori*, test for HIV , typhoid and Hepatitis B serologically.
- **Perform Clinical chemistry** – By preparing standard acid solutions, carry out Blood Glucose test, carry out Urine biochemical tests, and carry out Occult blood test.
- **Carry out quality control** by carrying out policiency testing, follow S.O.Ps manuals for equipment maintence and cleaning of equipment, ascertain expiry of consumables, carry out blinded checking and determine quality of reagents.
- **Maintain Health Information Management System (HIMS)** through preparing an up-date stock cards, prepare laboratory reports, maintaining a laboratory inventory, disseminate laboratory information, complete patient/client laboratory report card, and store laboratory registers.
- **Maintain laboratory equipment** through care for equipment by cleaning, covering, switching off/ defrosting equipment, report faulty equipment, maintain laboratory equipment log books, and organize and storage of equipment.
- **Perform administrative tasks** through knowing ideal channels of communication, prepare administrative reports, carrying out consultations, participating in community out-reach activities, and observing professional ethics.
- **Pursing professional development** through conducting on job training, participate in educational refresher work-shops, learn new equipment technologies like advanced immunological techniques ELISA, participate in Health events and net working with peers.

COURSE MODULE BREAK DOWN AND STAFFING

(the practical exercises are not included in this break down(PEXs)- can be extracted from the curriculum).

YEAR I SEMESTER I				
YR I	SEM I	Module/course unit and In-charge	Learning & working assignments (LWAs) (the respective PEXs are detailed in the curriculum)	Course code as assigned by UAHEB
		General Laboratory Practice Taught by Mr. Walakira and Mr. Onoria Emmanuel	<ul style="list-style-type: none"> • Maintain laboratory equipment and apparatus (LWA 3) • Operate or use laboratory equipment (LWA 4) • Specimen reception (LWA 5) 	CLT 1101
		First Aid, Laboratory Safety and Ethics taught by Clovies	<ul style="list-style-type: none"> • Carrying out lab safety practices. (LWA 1) • Perform first aid in a laboratory setting (LWA 2) • Professional Ethics 	CLT 1104
		Microbiology I taught by Mr. Ssali	<ul style="list-style-type: none"> • Perform sterilization (LWA 1) • Prepare stains and reagents. (LWA 2) 	CLT 1103
		Parasitology I taught by Onoria	<ul style="list-style-type: none"> ➤ Prepare reagents and stains used in parasitology. (LWA 1) ➤ Examine blood for haemoparasites. (LWA 3) 	CLT 1102
		Computer Applications taught by Mr. Ecowu Patrick	<ul style="list-style-type: none"> • Perform Microsoft applications and other computer packages (LWA 6 Under Module7- management and Entrepreneurship) 	CLT 1105
		Practical by all laboratory tutors	Covering all the above	CLT 1106
YEAR I SEMESTER II				
YR I	SEM II	Module/course unit and In-charge	Learning & working assignments (LWAs) (the respective PEXs are detailed in the curriculum)	Course code as assigned by UAHEB
		Microbiology II by Mr. Kiggundu and Mr. Ssali	<ul style="list-style-type: none"> • Examine urine (LWA 3) • Examine sputum (LWA 4) • Examine swabs (LWA 5) • Carry out serological tests (LWA 6) 	CLT 1202
		Parasitology II by Mr. Onoria Emmanuel	<ul style="list-style-type: none"> • Carry out stool analysis for intestinal protozoans (intestinal nematodes and protozoans, urogenital parasites including <i>S.haematobium</i>) (LWA 	CLT 1201

			2 and 4)	
		Haematology I by Clovies	<ul style="list-style-type: none"> • Prepare anti-coagulants (LWA 1) • Perform haemoglobin estimation tests (LWA 2) • Perform total white blood cell count (LWA 3) 	CLT 1203
		General Practical by all tutors.	Covering all the above	CLT 1206
SECOND YEAR SEMESTER I				
YR II	SEM I	Module/course unit and In-charge	Learning & working assignments (LWAs) (the respective PEXs are detailed in the curriculum)	Course code as assigned by UAHEB
		Clinical Chemistry I by Mr. Kiggundu	Introduction to Clinical Chemistry and carry out urinalysis.	CLT 2103
		Parasitology III by Onoria Emmanuel	Carry out stool analysis for intestinal parasites (<i>Cestodes & Trematodes/Flukes</i>) (LWA 3 and 4)	CLT 2102
		Haematology II by Clovies	<ul style="list-style-type: none"> • Perform blood film examination (LWA 4) • Perform sickling tests (LWA 5) • Perform Erythrocyte sedimentation rate (LWA 6) 	CLT 2101
		Blood Transfusion I by Onoria and Mr. Kiggundu	<ul style="list-style-type: none"> • Introduction to blood transfusion. • Reagent preparation. • ABO and Rhesus grouping (LWA 1) 	CLT 2104
		General Practical by all laboratory tutors	Covering all the above	CLT 2106
SECOND YEAR SEMESTER II				
YR II	SEM II	Module/course unit and In-charge	Learning & working assignments (LWAs) (the respective PEXs are detailed in the curriculum)	Course code as assigned by UAHEB
		Clinical Chemistry II by Mr. Kiggundu/ Clovies Walakira	<ul style="list-style-type: none"> • Perform blood sugar tests (LWA 2) • Perform occult blood tests (LWA 3) 	CLT 2202
		Management & Entrepreneurship by Ms Nyakato	<ul style="list-style-type: none"> • Manage work teams (LWA 2) • Communicate with customers (LWA 3) • Perform financial 	CLT 2203

		management tasks (LWA 4) • Carry out quality control tasks (LWA 5)	
	Blood Transfusion II by Mr. Onoria/ Mr. Ssali	• Reagent preparation • Compatibility testing • Transfusion reactions • Blood banking	CLT 2204
	Practical by all laboratory tutors	Covering all the above	CLT 2206

Table 4: course modules in each semester, their LWAs and medical tutor incharge

ASSESSMENT OF MEDICAL LABORATORY STUDENTS

Assessment is both formative and summative. Formative assessments are school-based and constitute **15% of** the total mark and a summative assessment **85%** of the overall mark in a course module.

Both the summative and school based assessment comprise of performance test items, short essays, long essay type and multiple choice test items.

STUDENT ENROLLMENT IN CLT AT KIST

The program has so far successfully graduated two cohorts of students; with the first group whose year of entry was 2018, these were 8 students and completed in December 2020, the second group which had 15 students whose year of entry was 2019 completed in April-2022 (due to Covid 19 lock down). This group is still awaiting its results.

Currently, there are 16 students in their final year and final semester of study out of the 19 students that were enrolled for the program in March 2021. In addition, the first years are 13 students, and these were enrolled in February 2022.

FUTURE PROSPECTS

The faculty of laboratory medicine is working towards introduction of a Diploma in Medical Laboratory Technology for vertical progress of Medical Laboratory Assistants.

KIST MEDICAL LABORATORY INVENTORY

CHEMICALS AND CONSUMABLES	Description/ EXPIRY DATE
Glycerine (300mls)	July 2025
Diethylether (2ltrs)	Nov 2025
Benedict (800mls)	Nov 2024
Antiseras	04/2023
Ammonium sulphate (400g)	04/2023
4x giemsa (25g)	Sept 2023

Glucose (enzymax) 100mls	Jan 2023
10 parameter uristripes	17/01/2023
Antiseptic 100mls	
NaCl (200g)	
Sodium carbonate (500g)	
Anhydrous sodium carbonate	Dec 2024
Indian ink soln	
EDTA	
Phenol detached crystals	
Glacial acetic acid	June 2022
2x Leishman stain (25g)	
Leishman liquid	Feb 2022
EDTA tubes / vacutainers	1 pack
Serum tubes / vacutainer	1 pack
Potassium iodide (20g)	
Iodine crystals (68g)	
2x methylene blue stain (20g)	
Eosin yellow	
Immersion oil	
Sulphosalicylic acid (20g)	
Filter paper (100 circles)	
Ethanol	
HCl	
Methanol	
Sulphuric acid	
Sodium phosphate dibasic(500g)	Jan 2023
Formaldehyde	Jan 2023
2x Acetone	Sept 2023
500g Barium chloride	Nov 2023
Potassium dihydrogen orthophosphate(500g)	April 2023
Sodium acetate(500g)	Aug 2023
25g Safranin	Sept 2023
Field stain A	May 2023
Field stain B	Jan 2023
Methylene blue solution	04/2023
Sodium metabisulphite	Sept 2023
Trisodium citrate dehydrate	Feb 2026
Nitric acid	Aug 2024
2x strong carbolfuschin (200mls)	Expired
Ammonia	Dec 2023
Hydrogen peroxide	Aug 2023
Crystal violet	Feb 2023
Acetone	April 2024

Malachite green	Jan 2023
2x ethanol	Jan 2025
25g Basic Fuchsin	
Neutral red	Jan 2026
New lugol's iodine	Jan 2026

Table 5: reagents/consumables in the KIST medical lab for CLT trainees

Hot air oven	01 and operational
Writing marker(black)	01
Distiller	01 from pharmacy lab
Conical flask	10 Glass type
Beakers (glass)	
500mls	04
100mls	17
200mls	03
400mls	05
250mls	05
Beakers Plastic	
250mls	05
Buckets	02
Pipettes(5mls)	05
(10mls)	04
Lab thermometers	19
Filter funnels plastic	37
Wash bottles	27 and Some have reagents
Volumetric flask (500mls)	10
50mls	10
100mls	10
Pipettes(20mls)	05
30cm transparent Ruler	01
Droppers	31
Test tubes (pyrex)	98
Test tubes racks	10 Wooden and 2 plastic
Slide box (glass)	01
Tiles	14
Test tube brushes	05
Wet and dry hygrometer	02
falcon tubes	25
Staining rack	01
Micropipette	01 100microlitre capacity
Drying rack	01
Cuvettes(round)	16
Cuvettes (squares)	07
Jerrycans(20ltrs)	03
Jerry cans 5ltrs)	12
ESR stands	-
westergreen tubes	-
Moppers	05
Magnifying lens	With plastic handles
Sahli's haemometer	03
Test tube brushes	05
Triple beam balance	01

Ice/ Freeze block	01
Litmus paper blue	01 pack
Litmus paper red	01 pack
rectangular boards	05
White blood cell counter	06
Hand tally counter (4 digits)	10
Crocodile clips	04
Orbital shaker	01
Intelligent shaker	01
Glucometer	01 Faulty
Basket	01
Wooden application stick	-
Chairs	01
HaemoCue	01
Calorimeter (old model)	01
Digital calorimeter	03 Fully operational
Chambers for counting blood cells	05 packs
Capillary tubes	-
Mortar and pestle	10
Vortex mixte	01
Triple balance with weights of 500g and 2(1000)g	01
Microscopes(05) new	05 operational
(4) old diagnostic microscopes	3 are faulty
1 simple microscope	
Electric centrifuge	02 Fully operational
Manual centrifuge	01
Coverslips	6000 (6- 1000 packs)
Bulb sucker	01 From skills lab
Wooden retort stands	10
Measuring cylinder (plastic)	
100mls	09
1000mls	03
Measuring cylinders Glass	
250mls	03
500mls	02
1000mls	01
Stool containers	--
Urine containers	-
Anaerobic jar	01

Table 6: showing list of laboratory apparatus and equipment

PHOTO GALLERY OF LABORATORY EQUIPMENT AT KIST LABS



















