Minimum Standard Requirements for

Courses Affiliated to

Kerala University of Health Sciences

Thrissur 680596

Bachelor of Science in

Medical Laboratory Technology

(B.Sc MLT)

Course code: 012

MINIMUM STANDARD REQUIREMENT FOR THE COURSE B.Sc(MLT)

1. GENERAL DESCRIPTION OF THE COURSE

No	Item & Description
1.1	***Title of the course*:** "Bachelor of Science in Medical Laboratory Technology" – abbreviated as **BSc(MLT)**
1.2	***Aim of the course:*** 1. To become a competent laboratory personal having professional skill in clinical diagnostic laboratory practice as technologists, supervisors and quality control managers. 2. To assist the research works in research institutions as a skilled technologist. 3. To develop skill in the operation and maintenance of all equipment used in diagnostic laboratories. 4. To organise a good clinical laboratory. 5. To become faculties in the discipline of Medical Laboratory Technology.
1.3	***Objectives of the course:*** At the end of the course the candidates shall be: 1. Aware of the principle underlying the organization of a clinical laboratory. 2. Able to do routine and special investigative procedures in medical laboratory practice. 3. Provided with a good theoretical and practical education in the field of Medical Laboratory Technology. 4. Provided with knowledge and skill in accordance with the society's demand in Medical Laboratory Technology. 5. Aware of the aspects in research methodology, Biostatistics and submission of project work during the course. 6. Trained to operate and maintain all equipment used in laboratory diagnostics. 7. Qualified for official approval as medical laboratory technologist. 8. Able to establish and manage a clinical or Research laboratory. 9. Qualified to become a skilled Technologist and faculty in the field of Medical Laboratory Technology.
1.4	***Minimum admission capacity+ Enhancement slot:10*** As approved by KUHS from time to time. Minimum 30/ 40 or 50 (maximum)

	Enhancement slot-10 Maximum 50/batch	
1.5	***Duration:*** BSc(MLT) -Four years	
1.6	***Academic eligibility*** +2 or equivalent with Physics, Chemistry, Biology with 50% marks (usual relaxation for SC/ST/OBC and other eligible communities)	
1.7	***Mode of selection:*** The selection of students shall be on merit basis, ensuring transparency and fairness. The process shall be as decided by the competent authority approved by the Government of Kerala and Kerala University of Health Sciences from time to time. (in terms of the respective course regulations and MSR)	
1.8	***Allotting authority:*** Agency approved by Government of Kerala/KUHS.	
1.9	***Seat reservation:*** As stipulated by Govt of India/Govt of Kerala/KUHS from time to time.	
1.10	***Course subjects to study:***	
1.10.1	1st Year	Anatomy, Physiology, Biochemistry-I, Basic Microbiology & Immunology and Basic Medical Laboratory Science & Haematology-I.
1.10.2	2nd Year	Biochemistry-II, General Microbiology, Parasitology & Entomology and Haematology-II &Clinical Pathology.
1.10.3	3rd Year	Biochemistry-III, Bacteriology, Cytology &Transfusion Technology and Computer Application, Research methodology, Biostatistics & Laboratory management.
1.10.4	4th Year	Biochemistry-IV, Mycology, Virology & Applied Microbiology, Histotechnology & Cytogenetics.
1.10.5	5th Year	NA
1.10.6	***Internship:*** No Internship	
1.10.7	***Medium of Instruction and Examination***	*English*
1.11	***Controlling authorities:*** State Council / KUHS / Others	

1.12	***Council registration if any:*** After successful completion of the course the candidate should register at present, in the Kerala State Paramedical Council and in future Central /State Council if any, to be eligible for practise as Lab technologist/Faculty.
1.13	***Availability of the course under KUHS:*** Refer KUHS Web Site www.kuhs.ac.in
1.14	***Scope for higher studies:*** MSc MLT in (Biochemistry, Microbiology & Pathology) and other PG courses like MSc Biotechnology, MSc Biochemistry , MSc Microbiology, MPH,MHA.

2. MINIMUM REQUIREMENT TO APPLY FOR ESTABLISHING AN INSTITUTION AND STARTING BSc(MLT) COURSE

No.	Item &Requirement
2.1	**Eligibility to apply for establishing an institution.**
2.1.1	***The applicant seeking affiliation shall meet the following eligibility criteria*:** 1. The institution shall be one imparting education in Modern Medicine /Allied Health Science subjects. 2. No institution having an existing affiliation for any course from another University shall be eligible to apply for affiliation to the K.U.H.S. 3. Need to satisfy the requirement of the State Paramedical Council at present and proposed Council before or after applying to KUHS.
2.1.2	***The applicant for affiliation shall be an institution owned and managed by:*** 1. Government of India or the State Government, 2. An autonomous body promoted by Central and/or State Government, by or under an enactment for the purpose of Health Science Education, 3. A society registered under the Societies Registration Act, 1860 or corresponding Act in the State 4. A public, religious or charitable Trust registered under the Trusts Act or the Wakfs Act, 1954.
2.1.3	***Qualifying criteria:*** *As per 2.1.3 of General MSR of KUHS*
2.1.4	***General conditions to be satisfied by colleges*:** *As per 2.1.4 of General MSR of KUHS*
2.2	**Land requirement –for details refer 3.1**

2.3	**Hospital requirement:** An established Hospital with well-established laboratory services functioning for at least one year
2.3.1	***Hospital ownership:*** The hospital, clinical, and academic facilities should be owned by the same management. Other forms of hospital facility like those governed by other management or by any forms of memorandum of understanding etc. may not be permitted for the conduct of BSc (MLT) course ***Hospital facility:*** The hospital shall be suitably spacious to accommodate all facilities required for the course and as specified in the Regulation of the respective Statutory Council/ MSR for the course.
2.3.2	***Hospital bed Strength with percentage of occupancy:*** 150 beds for B.Sc MLT with 75% occupancy
2.3.3	***IP/OP:*** 400 Out patients daily for starting BSc(MLT). The College and Hospital shall maintain the central registration system for maintaining the records of patients in Out-Patient Department and In-Patient Department. The hospital shall also maintain the Department wise OP and IP records, case records of OP/IP, laboratory and radiological investigation reports, medicines dispensing register, diet register for IPs, duty roster of hospital staff, birth and death certificates, etc. to substantiate the claim of genuine functional of a teaching hospital fulfilling the norms as specified in the sub-regulation.
2.3.4	***Departments/Clinical facilities needed in the hospital:*** Well established -clinical laboratories for Biochemistry, Microbiology &Pathology should be present major departments like, General Medicine, General Surgery, Paediatrics, OB&G and related specialty departments also should be present to provide adequate laboratory samples
2.3.5	***Exclusive minimum requirements in the hospital laboratory for the course:*** It should have sufficient work space in the Clinical Laboratories and infra-structure facilities for the accommodation of 30/ **40/50** BSc (MLT) trainees on rotation basis. Biochemistry, Microbiology, Pathology (Cytology, Histopathology, Clinical pathology, Hematology and Blood Bank).
2.5.2	***Inpatients:***

	150 bedded hospitals with 75% Bed occupancy
2.5.3	***Specialty cases:*** See Annexure 3.8.5
2.6	**Man Power requirement**
2.6.1	***Teaching staff*** Total regular **full time** faculties for the main subjects for four years – 12 Nos Part time Faculties – 4 Nos **Year wise teaching posts for newly started colleges.** **First year.** • *Professor of MLT -1 • Asst.Professor of MLT with minimum 3-year post PG teaching **(UG/PG level teaching experience only)** experience in MLT-3 (1 each for Biochemistry, Microbiology & Pathology). • Guest/Part time teachers for Anatomy & physiology. ***Second year.*** In addition to the teaching staff for first year, • Asst.Professor/ Senior lecturer / Lecturer / **Tutor technician** with BSc-MLT – 3 Nos (1 Each for Biochemistry, Microbiology & Pathology). ***Third year.*** In addition to the teaching staff for first & second year, • Associate Professor of MLT-3Nos (1 Each for Biochemistry, Microbiology & Pathology). • Guest /part time teachers for Biostatistics, Research methodology, Management & computer application. ***Fourth year.*** In addition to the teaching staff for first, second & third year, Professor of MLT -2 Nos (1each for the two basic subjects of MLT other than the one appointed for first year.) **If principal of the college is eligible for the post of Professor of MLT and if he/ she is routinely involved in the teaching programme of BSc (MLT) he/she may be considered as a professor in the subject concerned.*
2.6.2	***Non-teaching:***
2.6.2.1	***Technical:*** Lab Technician – 3 Nos Junior Laboratory Assistant – 1 Laboratory attnenders-3

2.6.2.2	***Ministerial: (common for all courses in the AHS college)*** Administrative Officer-1 Office Supdt.-1 Accountant/Cashier-1 DEO/Comp Asst-1 Clerk-1 Store Keeper-1 Office/Class room Attender-1 **shall be shared with other courses of the college.**
2.6.2.3	***Qualifications- examiners & Question paper setters*** • Practical *Examiner-Assistant Professor or above with minimum 3 year post PG teaching experience* • Theory *Evaluator- Assistant Professor or above with minimum 3 year post PG teaching experience* • *Question Paper setter/Scrutinizer- Associate professor or above with minimum 8 year post PG teaching experience* *UG Project Guide- Assistant Professor or above* ***with minimum 3-year experience***
2.7	**Statutory permissions**
2.7.1	***State/Central Govt.*** • The institution shall fulfil all the statutory requirements of the State or local authority to establish and run the institution and shall submit the updated certified copies of such permission(s) to the University. • Required Essentiality Certificate/ permissions from the respective Government (As per first Statute Chapter XXI: 10(8)), or wherever insisted by the Statutory Council/KUHS, is obtained and produced along with the application. • The institution name along with Trust Deed / Society address shall be mentioned in the Essentiality Certificate/ permissions from the respective Government. Period or term of validity of the certificate also should be mentioned in the certificate
2.7.2	***Statutory councils:*** The applicant should obtain necessary Consent/Permission from State/Central Councils governing the course as applicable.
2.8	**Other requirements.** The documents mentioned under item 2.8 should be submitted along with the application form.
2.8.1	***Resolution of the trust:***

	Attach attested copy of the specific Resolution of the Trust/Management mentioning the name of the institution and name of the course being requested
2.8.2	***Detailed project proposal:*** The applicant shall submit a detailed project report for starting and continuing the academic program fulfilling the norms of apex council and KUHS along with the application
2.8.3	***Legal documents:*** Attach copy of the following documents to prove the ownership of the College and Hospital & other infrastructure facilities. 1. Clear title deed of the property in favour of the applicant; 2. Copies of constitution, bye-laws and certification of registration of the agency proposing to start college/course. 3. Resolution of the management earmarking area and purpose of running the institution/course concerned; 4. A sketch showing the specific area so earmarked with boundary description, measurements and all details required for identifying the land; 5. A declaration signed by the applicant to the effect that the area so ear marked shall not be used for running any other institution; 6. Details of the financial guarantee proposed to be furnished to the University by the Management 7. Copy of agreement, if any, executed with the Government, and Essentiality certificate/permission of the Government, wherever applicable. 8. Affidavit in Form 1B executed in stamp paper of appropriate value under the Kerala Stamp Act.
2.8.4	***Financial statement:*** Attach attested copy of Audited Balance sheet of the applicant entity for the previous 3 (three) years for Non Governmental organizations and budget allocation for parent institution in the case of Government
2.8.5	***Essentiality/NOC from Govt:*** The certificate regarding feasibility and desirability for admission capacity at the college has to be obtained by the applicant from the Government/Central/State Councils
2.8.6	***Approved plan:***

	Attach copy of attested site plan and building plan including academic block, administrative block , hostels, play ground as approved by Local Self Government
2.8.7	***Clearance from Pollution Control Board:*** All the academic institutions and parent hospitals shall take adequate pollution control measures by providing incineration plant, waste disposal measures, sewage water treatment plant, landscaping of the campus etc and submit copy of the Clearance certificate from the Pollution Control Board**.**
2.8.8	***Undertaking:*** *As per 2.8.8 of General MSR*
2.9	**Time & Mode of Application.** As per Notification of KUHS for a particular academic year.
2.9.1	***Application fee:*** As fixed by KUHS from time to time.
2.9.2	***Processing of application:*** As per2.9.2 of General MSR
2.10	**Perspective Plan:** Background information to be provided with the application

3.MINIMUM STANDARD REQUIREMENTS (MSR) TO START THE BSc MLT COURSE

3.1	**LAND FOR THE INSTITUTION.**
3.1.1	***Owner ship of land:*** The Hospital, Clinical, Academic and hostel facilities should be owned by the same management. Other forms of hospital/College facility like those governed by any other management or charitable society or by any forms of memorandum of understanding may not be permitted -for the conduct of BSc (MLT) course.
3.1.2	***Area required:*** Municipality & Corporation Limit - 100 cents Other Areas - 200 cents
3.1.3	***Single/Multiple:*** Single or multiple

3.1.4	***Distance between plots:*** 100 metres.
3.1.5	***Approval from local authorities:*** Submit certificates from local authorities
3.1.6	***Hospital- Distance from teaching institution:*** Parent Hospital should be preferably within the same campus or within 15 kms from the institution by road.
3.1.7	***Availability of water:*** Adequate and safe continuous drinking water facilities must be provided for staffs and students. Also should provide continuous water supply to the Academic block, Hospital, Laboratories, Hostels etc.
3.1.8	***Availability of electricity:*** There shall be continuous power supply round the clock with generator facility, provided to the Hospital, College, Hostels and all other infrastructure areas.
3.1.9	***Availability of public conveyance:*** Good public transport system should be available at the campus or at a maximum of 500-meter distance from the Institute.
3.1.10	***Waste disposal:*** Adequate waste disposal measures should be taken as per the Govt .norms.
3.1.11	***Permission of Pollution Control Board:*** Submit the permission letter from the pollution control board.
3.1.12	***Play ground:*** Shall be shared with other courses in the Institute/College.
3.1.13	***Parking area:*** Adequate parking space shall be made available for parking of institutional vehicles, vehicles of staff, students and patients.
3.2	**Infrastructure for the college**
3.2.1	***Total plinth area required:***

	14000sq.ft. Institution shall be housed in the campus of the hospital where the training in clinical laboratory practice is intended to be provided or within a radius of 15 kilometer of the hospital campus
3.2.2	***Approved plan for the building:*** Shall be submitted along with the application. Attested site plan and Building plan including hostels, playground and administrative block approved by Local Self Government
3.2.3	***Lecture halls with teaching aids:***
3.2.3.1	***For 30 students per batch-4 Nos*** 55M^2 (600Sq.ft) It shall be arranged to seat 30 students with proper ventilation, lighting system, electricity supply, audio-visual teaching aids, fans or coolers and comfortable sitting arrangement preferably theatre type. There should be built in black/green/white boards. There should be a desk/ dais /a big table and a chair for the teacher and racks/cupboards for keeping teaching aids or any other equipment needed for the conduct of classes.
3.2.3.2	***For 40 students per batch. -4 Nos.*** 67M^2 (720Sq.ft) It shall be arranged to seat 40 students with proper ventilation, lighting system, electricity supply, audio-visual teaching aids, fans or coolers and comfortable sitting arrangement preferably theatre type. There should be built in black/green/white boards. There should be a desk/ dais /a big table and a chair for the teacher and racks/cupboards for keeping teaching aids or any other equipment needed for the conduct of classes.
3.2.3.3	**For 50 students per batch- 4 Nos** 80M^2 (860Sq.ft) It shall be arranged to seat 30 students with proper ventilation, lighting system, electricity supply, audio-visual teaching aids, fans or coolers and comfortable sitting arrangement preferably theatre type. There should be built in black/green/white boards. There should be a desk/ dais /a big table and a chair for the teacher and racks/cupboards for keeping teaching aids or any other equipment needed for the conduct of classes
3.2.3.5	***Year wise need for lecture hall for newly starting colleges.*** ***First year-1***

	Second year-2 ***Third year-3*** ***Fourth year-4***
3.2.4	***Examination hall with confidential room:*** Examination hall should meet the requirements specified by KUHS from time to time. Availability of hall / halls of the required size to accommodate all the Regular and supplementary candidates attending the examination at a time. The hall/halls shall have sufficient facilities like availability of light, drinking water, fan/air conditioner, attached toilet etc. Availability of a confidential room attached to the examination hall with two numbers each of desktop/laptop computers, printer/digital copier/multi-functional office machine, UPS and Internet connectivity (2 No, NME-ICT/NKN Optical fibre internet connection, VPN Setup equipment) all in working condition. In addition to this, the room shall also be equipped with fax, and land line phone facilities, all in working condition and supported by Power Generator. Surveillance Camera system of the required specifications in working condition. Communication Signal jammer of the required specification in working condition This facility may be shared with other courses in the institute.
3.2.5	***Auditorium/Multipurpose Hall:*** 200M^2 (2150 sq.ft) to accommodate 200 people It shall be shared with other courses in the institute. Shall be spacious enough to accommodate full strength of students, so that it can be utilized for hosting functions of the college, educational conferences/workshops and examinations. It should have proper stage with green room facilities. It should be well ventilated and have proper lighting system. There should be arrangements for the use of all kinds of basic and advanced audio-visual aids This facility may be shared with other courses in the institute.
3.2.5.1.	***Centralized answer paper valuation hall/ Digital valuation rooms***
3.2.6	***Common room for Boys & Girls:***

	A minimum of 2 common rooms should be provided- one for male students and one for female students with sufficient and adequate seating arrangements, cupboards, lockers, cabinets, built -in –shelves and racks should be provided in all the common rooms. Should have at least one cot with bed for sick students to rest. Toilet and hand washing facilities should be made available in each room.
3.2.7	***Staff rooms:*** • There should be a separate office for the principal with attached toilet and provision for visitor's room. Independent telephone facility is a must for the principal's office with intercom facility connected/linked to the hospital and hostel and a computer with internet facility. • There should be a separate office for the Vice Principal with attached toilet and provision for visitor's room. Independent telephone facility is a must for the Vice-Principal's office with intercom facility connected/linked to the hospital and hostel and a computer with internet facility. • There should be adequate staff rooms in proportion to the number of teaching faculty with gender specific toilets. • Provide separate room for the Heads of the Department/Professors. • There should be separate staff rooms for non-teaching staff with adequate toilet facility. It should be spacious enough to accommodate the entire office staff. • Each office room should be adequately furnished with items like tables chairs cupboards built –in- racks and shelves, filing cabinets and book cases. • Also, there should be provision for computers, internet and telephone.
3.2.8	***Administrative block:*** 75 $M^{2.}$ (810 Sq.ft) Administrative block of the college shall include Principal's Room, Personal Assistant's Room, Reception, Visitor's lounge, Staff Committee room, administrative section, Cash and Accounts section, Record room with telephone, photocopier, computer, internet facility and adequate toilets.
3.2.9	***Central store:*** 25 M^2 (270 sq.ft) with adequate side slabs to keep the chemicals, glass wares, equipment, miscellaneous items and other inventory articles which are required in the laboratories of the college, properly lighted and well-ventilated.
3.2.10	**Laboratories.**
3.2.10.1	***Microbiology Laboratory:*** 120 M^2 (1290sq.ft) for 30 students (1) 81(9x9) M^2 for exclusive Laboratory living space with adequate work benches of either one sided (size 36 meter (6 rows) length ,75cm height and 75 cm breadth

	) or double sided (18 meter(3 rows), 75cm height and 150 cm breadth) seating arrangements. It shall be provided with cupboard with lock and key, gas and water connections, ceramic wash basins with water taps (swan neck),tube lights and two tier bottle rack. Adequate drainage facilities and electrical plug points to connect the three pin plugs of microscopes in each seat. One wash basins shall be fitted between two seats in case of one sided work benches or between four seats in case of double sided seats. Also the lab should have a side PCC slab of total length 12 metre (Breadth 75CM,Height-75CM) with a minimum of 5 Nos.of 15Amp socket and 10Nos,of 5 Amp sockets with adequate distance so as to connect the Hot air oven ,incubator and other equipment. The Laboratory shall be fitted with ground glass writing board or white board so that all the students can have a direct view or without turning not more than 90 ^{0} from their seat. Laboratory living space & work benches have to be modified for batches of 40 & 50 students accordingly.. **Total Laboratory area** • **For 40/Batch**- Total area_148M^2 (1593sq.ft.). 108 M^2 for living space & 39 M^2 for related purposes. • **For 50/Batch**- 174 M^2 (1873 Sq.ft) 135 M^{2}for living space & 39 M2 for related purposes (2) Room/Cabin for Technical staff(7M^2) preferably transparent glass fronted with clear view to the Lab., (3) Lab store 7 M^2 with sufficient slab/Almirah to place the glassware, miscellaneous materials and chemicals. (4) Media room with a minimum area of 7M^2 (a glass fronted cabin) with 2 meter PCC slab with granite or ceramic top and with sink, water and gas connection. There should have two 15 Amp socket and two 5Amp socket. (5) Washing room and sterilization section of 18M$^{2.}$ with sufficient PCC slab with granite or ceramic top. It shall be fitted with 4 Numbers of 15 Amp and 3 No. of 5 Amp sockets. (6) Height adjustable revolving half chair or stool (40 Nos.)
3.2.10.2	***Biochemistry Laboratory****:* 110M^2 (1183sq.ft) for 30 students 1) 81(9x9) M^2 for exclusive Laboratory Living space with adequate double sided work benches with 2 tier bottle rack (Length18 meter (3 rows),100 cm height and 150 cm breadth). It shall be provided with cupboard with lock and key, gas and water connections and ceramic wash basins with water taps (swan neck). Adequate drainage facilities

	with a corner sink (60X60X60CM) and electrical plug points (5Amp) to connect with minor equipment. One wash basin shall be fitted between four seats. Also, the lab should have a side PCC slab of total length 12 meter (Breadth 75CM, Height-75CM) with a minimum of 5 Nos.of 15Amp socket and 10Nos, of 5 Amp sockets with adequate distance so as to connect the Hot air oven, incubator and other equipment. The Laboratory shall be fitted with ground glass writing board or white board so that all the students can have a direct view or with turning not more than 90 ^{0} from their seat. (2) Room/Cabin for Technical staff (7M^2) preferably transparent glass fronted with clear view to the Lab. (3) Lab store 7 M^2 with sufficient slabs to place the Laboratory wares and chemicals. (4) Instrument room 15 M^2. with sufficient PCC slab with granite or ceramic top. (75 cm Breadth and 75 cm height) It shall be fitted with 4 Numbers of 15 Amp and 10 No. of 5 Amp sockets. Water connection with swan neck taps and also with gas connection. (5) Height adjustable revolving half chair or stool (40 Nos.) Laboratory living space & work benches have to be modified for batches of 40 & 50 students. **Total Laboratory area** For 40/Batch- 138M^2 (1485sq.ft.). 108 M^2 for stedents' living space & 30 M^2 for related purposes. For 50/Batch- 165M^2 (1776Sq,ft). 135 M^2 for living space & 30 M2 for related purposes.
3.2.10.3	***Pathology Laboratory:*** 110M^2 (1183sq.ft) for 30 students (1)81(9x9) M^2 for exclusive Laboratory living space and facilities like that of Microbiology Lab. (2) Room/Cabin for Technical staff (7M^2) preferably transparent glass fronted with clear view to the Lab. (3) Lab store 7 M^2 with sufficient slabs to place the Laboratory wares and chemicals.

	(4) Washing room and Preparation section. section of 15$M^{2.}$ with sufficient PCC slab with granite or ceramic top. It shall be fitted with 4 Numbers of 15 Amp and 3 No. of 5 Amp sockets. (5) Height adjustable revolving half chair or stool (40 Nos). Laboratory living space & work benches have to be modified for batches of 40 & 50 students. **Total Laboratory area** • For 40/Batch- 138M^2 (1485sq.ft.). 108 M^2 for living space & 30 M^2 for related purposes. • For 50/Batch- 165M^2 (1776Sq, ft). 135 $M^{2.}$ for living space & 30 M2 for related purposes.
3.2.10.4	**Anatomy and Physiology Laboratory:** (1) Demonstration room-There shall be one demonstration room (50M^2) with chairs and table to accommodate 30 students for the demonstration of Anatomy & Physiology practical classes. (2) Museum- There shall be a museum provided with rack and shelves for storing and display of wet and dry specimens and embryological sections ,models etc *(Anatomy and Physiology laboratory of medical/Dental/ Nursing /Other Allied courses of the same institute shall be shared for the BSc(MLT) course)* Laboratory living space & work benches have to be modified for batches of 40 & 50 student. Total area, For 40/batch- 60M^2. For 50/batch- 7oM^2
3.2.10.6	***Seminar room:*** 50M^2 with chairs to accommodate 60 students, LCD Projector with computer.
3.2.11	***Library:*** 100$M^{2.}$ Well lighted and ventilated, preferably air conditioned. It should have adequate number of chairs and table with number of books and journals. Library shall be a minimum of 1000 books with a minimum of 25 titles with 10 copies of text

<table>
<tr><td></td><td>books and one copy of reference book in each related subjects for BSc.MLT course with 30 admission per year. It should have E-journal facility preferably with full text and back up availability. It shall be equipped with a minimum of 5 systems with multimedia support. A minimum of one system with scanner, printer facility, photocopier. It should have attached gender specific toilets.

Number of books should be increased proportionately for batches 40 and 50.

For batch of 40 students- 1300 books.

For batch of 50 students – 1600 books.</td></tr>
<tr><td>3.2.11.1</td><td>Year wise number of books to be procured for newly starting colleges
<table>
<tr><td rowspan="2">YEAR OF STUDY</td><td colspan="3">Number of Books</td></tr>
<tr><td>For batch of 30</td><td>For batch of 40</td><td>For batch of 50</td></tr>
<tr><td>First year</td><td>250</td><td>325</td><td>400</td></tr>
<tr><td>Second year</td><td>500</td><td>750</td><td>800</td></tr>
<tr><td>Third year</td><td>750</td><td>1075</td><td>1200</td></tr>
<tr><td>Fourth year</td><td>1000</td><td>1300</td><td>1600</td></tr>
<tr><td colspan="4">After fourth year 10% increase in every year with recent books & new editions of the reference books.</td></tr>
</table></td></tr>
<tr><td>3.2.12</td><td>Toilets:
Separate toilets for boys and girls shall be made available in each floor.</td></tr>
<tr><td>3.2.13</td><td>Garage:
Garage to accommodate vehicles of the Institute should be maintained within the campus.</td></tr>
<tr><td>3.2.14</td><td>Canteen:
There should be provision for a common canteen for the students, their guests, and staff members of all courses in the institute.</td></tr>
<tr><td>3.2.15</td><td>Transportation facilities:

College should have separate transportation facility under the control of the principal, for use of staff and students</td></tr>
<tr><td>3.2.16</td><td>Room for audio-visual aids:

Room should be provided for the proper and safe storage of all the Audio- Visual Aids.</td></tr>
<tr><td>3.2.17</td><td>Fire & Safety measures :</td></tr>
</table>

	Adequate provision for extinguishing fire should be available with valid certification of fire & safety authority.

3.3 MAN POWER REQUIREMENT

3.3.1	**Teaching Staff (Number , Qualification & Experience required)**			
	Designation	No	Qualification	Experience
3.3.1.1	**Principal** •In MLT Institution attached to Medical Colleges the Principal of the Medical College act as the Principal of MLT course. • In MLT Institution not attached with Medical College, a Professor in MLT will be appointed as the principal.	1	• MD in Pathology/ Microbiology/Biochemistry OR •MSc(MLT) Pathology/Microbiology/ Biochemistry with PhD in the concerned subject.	For MD holders as per MCI norms For MSc MLT holders 15 years of teaching experience out of which 5 years must be as Professor
3.3.1.2	**Vice Principal** Vice Principal will be the senior most Full time Professor in the MLT college.		Pathology/ Microbiology/Biochemistry OR • MSc MLT Pathology/Microbiology/ Biochemistry with PhD in the concerned subject.	Same as Professor
3.3.1.3	**Professor** One each in the subjects of Pathology, Microbiology and Biochemistry. *If Principal is having qualifications for the post of Professor of MLT, he/she shall be taken as	3	• MD Pathology/ Microbiology/Biochemistry OR • MSc MLT Pathology/Microbiology/ Biochemistry with PhD in the concerned subject.	For MD holders as per MCI norms For MSc MLT holders 10 years of teaching experience out of which 5 years as Associate Professor

	the professor of the concerned subject of specialization (if the principal is involved in the routine academic activities including theory & practical classes).			
3.3.1.4	**Associate Professor** One each in the subjects of Pathology, Microbiology and Biochemistry .	3	MD Pathology/Microbiology/ Biochemistry OR MScMLT Pathology/Microbiology/ Biochemistry (KUHS approved).	For MD holders as per MCI norms For MSc MLT holders 5 years of teaching experience out of which 3 years as Asst. Professor
3.3.1.5	**Assistant Professor** One each in the subjects of Pathology, Microbiology and Biochemistry .	3	MD Pathology /Microbiology/ Biochemistry OR MSc MLT Pathology/Microbiology/ Biochemistry (KUHS approved).	Lecturer with MSc MLT degree will be re-designated as Assistant Professor after 2 years of post PG teaching experience
3.3.1.6	**Lecturer/ Tutor/ Tutor Technicians** One each for the subjects of Biochemistry, Microbiology & Pathology.	3	MSc MLT (KUHS approved) Or BSc MLT (KUHS approved)with 2 years of laboratory experience	

3.3.1.7	Year wise split up	Appendix----(3.3.1.9)	
3.3.1.8	Assistant Professor / Senior Lecturer /Lecturer (Part Time Faculty)	4	Appendix----(3.3.1.10)
3.3.2	**Administrative staff**		
3.3.2.1	Administrative Officer	1 (Shall be shared with other courses)	
3.3.2.2	Office Supdt	1 (Shall be shared with other courses)	
3.3.2.3	PA to Principal	1 (Shall be shared with other courses)	
3.3.2.4	Accountant/ Cashier	1 (Shall be shared with other courses)	
3.3.2.5	DEO/Comp Asst	1 (Shall be shared with other courses)	
3.3.2.6	Clerk	1	Graduation in Computer experience (shall be shared with other courses of the college)
3.3.2.7	Store Keeper	1 (Shall be shared with other courses of the college)	
3.3.2.8	Office Assistant /Class room Attender	1	A Pass in standard-VIII
3.3.3	**Laboratory Staff**		
3.3.3.1	Lab Technician	3	DMLT-Pass (Approved by Kerala Paramedical council)
3.3.3.2	JLA	1	-Qualification for JLA approved by Kerala PSC
3.3.4	**Library staff**		
3.3.4.1	Librarian	1	Pass in Library Science
3.3.5	**Technical staff**		
3.3.5.1	Electrician	Can be shared between hospital, academic block and hostel.	
3.3.5.2	Plumber	Can be shared between hospital, academic block and hostel.	
3.3.5.3	Mechanic	Can be shared between hospital, academic block and hostel.	
3.3.6	**Supporting staff**		

3.3.6.1	Cleaning Staff	2	A pass in standard –VIII	
3.3.6.2	Security staff	Sufficient for round the clock service provision. (Common for all the courses in the college)		
3.3.6.3	Driver	Sufficient for round the clock service provision		
3.4	**Equipment / Instruments & Furniture**			
3.4.1	**Equipment / Instruments**	Appendix- 3.4.1		
3.4.2	**Furniture**	Appendix- 3.4.2		
3.5	**Laboratory**	Three main laboratories – Biochemistry, Microbiology and Pathology, a demonstration hall & a Computer Laboratory, The equipment required for these laboratories are stated in Appendix-3.4.1		Provide sufficient Glass wares and Chemicals/Reagents to conduct practical classes in these laboratories.
3.6	**Library**			
3.6.1	***Total area required:*** $100M^2$. Well lighted and ventilated, preferably air conditioned. It should have adequate number of chairs and table with number of books and journals. Library shall have a minimum of 1000 books with a minimum of 25 titles with 10 copies of text books and one copy of reference book in each related subjects for BSc.MLT course with 30 admission per year It should have E-journal facility preferably with full text and back up availability. It shall be equipped with a minimum of **5** systems with multimedia support. A minimum of one system with scanner, printer facility, photocopier. It should have attached gender specific toilets.			
3.6.2	***Reception & waiting area:*** Should be provided			
3.6.3	***Property & Issue counter:*** Should be provided			
3.6.4	***Reading room:*** Should be provided			
3.6.5	***Staff/PG reading room:*** Should be provided			

3.6.6	***Reference section:*** Separate reference section should be provided
3.6.7	***Journal section:*** Separate journal section should be available
3.6.8	***Photo copying section:*** Should be provided
3.6.9	***Internet/computer facility:*** hould be provided
3.6.10	***Room for Librarian:*** Should be provided
3.6.11	***Books needed for UG:*** 1000
3.6.12	***Journals needed: 6 (minimum 2 each in main subjects of MLT -Biochemistry, Microbiology and Pathology)***
3.7	**Hostels** Shall full fill criteria specified for approval of Hostels by KUHS
3.8	**Parent Hospital**
3.8.1	***Land:*** As per the general rules for 150 bed hospital.
3.8.2	***Infrastructure:*** It should have sufficient work space in the Clinical Laboratories and Infra-structure facilities for the accommodation of 30/40/50 BSc (MLT) trainees on rotation basis Biochemistry, Microbiology, Pathology (Cytology, Histopathology, Clinical pathology, Hematology and Blood Bank).
3.8.3	***Clinical Laboratories :***Biochemistry, Microbiology & Pathology laboratories
3.8.4	***Man power:*** For a four year BSc(MLT) course with 30 admissions per year should have ideally a minimum of 10 numbers of Laboratory Technicians/ Technologists/ Laboratory scientist with Govt and KUHS approved (BSc MLT / DMLT) qualification with paramedical council registration .
3.8.5	***Clinical material:*** Appendix - 3.8.5
3.8.6	***Laboratories:*** Biochemistry, Microbiology & Pathology Laboratories (Haematology, Clinical Pathology, Histopathology, Cytology, Cytogenetics and Blood Bank)
3.8.7	***Equipment:*** All major and minor equipment required for the investigations in Biochemistry, Microbiology-Bacteriology, Mycology, Virology, Parasitology, Immunology, Mycology, infectious diseases and Pathology - Haematology, Clinical Pathology, Histopathology, Cytology , Cytogenetics, Blood Bank.

Appendix - 3.3.1.9

The year wise faculty requirement for newly starting BScMLT courses.

Regular full time teaching faculties in the main subjects in BSc MLT Course

SI.NO	Year		Post & Qualification	No.of post
1	**Faculties for first year BScMLT**	1	Principal /Professor (If principal is from other stream of AHS, 1 Professor of MLT should be appointed in First year.)	1
		2	Assistant Professor (with 3-year post PG teaching experience)– Pathology, Microbiology & Biochemistry	3 (One each in the subjects of Pathology, Microbiology & Biochemistry)
		3	Assistant Professor / Lecturer (Regular/guest or part time) Anatomy – MD Anatomy / MSc Anatomy. Or MSc(MLT) with one year teaching experience in Anatomy.	1
		4	Assistant Professor / Lecturer Physiology –MD Physiology / MSc Physiology Or MSc (MLT) with one year teaching experience in physiology.	1
2	**Faculties for Second year** B.Sc MLT		Asst.Professor /Senior Lecturer / Lecturer/Tutor/Tutor Technician	3 (One each in the subjects of Pathology, Microbiology & Biochemistry)
3	**Faculties for Third year BSc MLT**	1	Associate Professors in MLT (one in each subject –Pathology, Microbiology and Biochemistry)	3 (One each in the subjects of Pathology,

				Microbiology & Biochemistry)
		2	Senior Lecturer -Biostatistics With MSc Biostatistics. (Regular/ guest/Part time) Or MSc(MLT) with one year teaching experience in Biostatistics.	1
		3	Lecturer – Computer Application With B-Tech – Electronics / Computer Science / Bio medical instrumentation. . (Regular/ guest/Part time) Or MSc(MLT) with one year teaching experience in Electronics / Computer Science / Bio medical instrumentation.	1
4	**Faculties for Fourth year BSc(MLT)**		Professor in MLT	3 (One each in the subjects of Pathology, Microbiology & Biochemistry) **If principal of the college is qualified for the post of Professor of MLT, and if he/ she is actively involved in the routineMLT teaching programme he/she may be considered as the Professor of the

				concerned subject..

Appendix - 3.3.1.10

Part Time Faculties in BSc(MLT) Department

SI.No	Year	Post	Qualification	No.of post
1.	First	Assistant Professor / Senior Lecturer - Anatomy	MD Anatomy/MSc Medical Anatomy. Or MSc(MLT) with one year teaching experience in Biostatistics.	1
2.	First	Assistant Professor / Senior Lecturer - Physiology	MD Physiology/MSc Medical Physiology Or MSc(MLT) with one year teaching experience in physiology.	1
3.	Third	Lecturer Biostatistics	MSc Biostatistics Or MSc(MLT) with one year teaching experience in Biostatistics.	1
4.	Third	Lecturer – Computer Application	B.Tech Electronics &Computer Application/ B.Tech Bio Medical Instrumentation Or MSc(MLT) with one year teaching experience in Electronics / Computer Science / Bio medical instrumentation.	1

Appendix - 3.4.1

List of equipment for the practical lab for a batch of 30BScMLT students

A, BiochemistryLaboratoty

Sl. No.	Name of the equipment	For batch of 30 students No	For batch of 30 students No	For batch of 30 students No
1	Colorimeter	3	4	5
2	Semi automatic clinical chemistry analyser. ***	1	1	2
3	Deionizer	1	1	1
4	Chromatographic apparatus with sprayer (For paper & thin layer chromatography) to run 20 samples at a time. ***	2	3	4
5	Electrophoresis apparatus with power pack and other accessories for -Agar gel electrophoresis ***	1	2	3
6	pH Meter	1	1	2
7	Electronic Balance(sensitivity 1mg)	1	1	2
8	Balance-Analytical	1	2	3
9	Vortex mixer	1	1	2
10	Centrifuge ,Remi model/ISI, rotary head, bucket of 15 ml capacity, speed up to 10,000 rpm.	2	2	3
11	Hot-air-oven 18x18x18”	1	1	2
12	Lab incubator size 24x24x24 “	1	1	2
13	Water bath 24x18x18”	1	1	2
14	Heater-Electric	2	2	3
15	Double distillation apparatus (All glass)	1	1	1
16	Pipette pumps of various volumes	10	10	20

17	Reagent Dispenser	3	3	4
18	Micropipette fixed volume - with various volume delivering capacity	10	15	20
19	Micro pipette with variable volume	5	10	15
20	Refrigerator double door =/> 285L	1	1	1

***** To be available during third year course of newly started college**

Glass wares, chemicals, reagents and miscellaneous items should be

Provided by the institute for the smooth conduct of Biochemistry Laboratory.

B. Microbiology Laboratory

Sl. No.	Name of the equipment	For batch of 30 No	For batch of 40 No	For batch of 50 No
1	Lab Incubator 18x18x18"(1 No), 24x24x24"-(1No) Incubator with ISI specification, with Inner chamber and perforated tray made up of stainless steel, with temperature regulator up to 100 ºC, sensitivity +/-1ºC, digital display	2	2	3
2	Hot air oven 18x18x18"(1 No), 24x24x24"-(1No) with inner chamber and perforated tray made up of s.s, with power indicator, heat control, heat regulator up to 400ºC, sensitivity of +/- 1ºC.and digital display	1	2	2
3	Autoclave vertical,24x18" – 1No vertical type made up of gun metal with 2000-4000 W immersion coil, with safety valve, pressure gauge, heat resistant gasket with perforated removable inner bucket, size diameter 18" and height 24"	2	2	2
4	Water bath 24x18x12"	1	2	2

	Water bath with inner chamber made up of stainless chamber (ss), perforated tray, temperature regulator up to 100ºC, sensitivity+/-1ºC, chamber Size 24"x18"x12"			
5	Centrifuge-Remi – 10000rpm speed	1	2	2
6	Heater with GI element	2	2	2
7	VDRL Shaker	1	2	2
8	Microscope, rechargeable, LED monocular/binocular microscope, stain resistant enamel finished body, Fully anti fungal coated optical system with high resolution ,monocular head with 360 degree rotation ,wide field eye-piece-5x&10x/18mm. Double layer mechanical stage 120x120x/60x40 mm. Plan Achromatic/ apochromatic objective– (DIN) 4x,10x/15X, 40X &100X Oil immersion objective NA=/>1.25,wide field compensating eye-piece-5X&10X, and Abbes condenser with NA=/> 1.25,with iris diaphragm, blue filter , with battery back up for a minimum of 6 hours (preferably carton's student microscope/ equalent model) Quadruple nose-piece, S-LED illumination cool with adjustable illumination In case of BScMLT-Microbiology- one microscope for each student	30	40	50
9	Bacterial colony counter	1	1	1
10	Seitz filter mount -with150mm disc(1 No),100mm disc(1 No)	1	1	1
11	Deep freezer-20^{0}c	1	1	1
12	Balance – electronic , digital with sensitivity 10 mg-1 No and sensitivity 1 gm – 1 No	2	2	2
13	Analytical balance, With weight box and fractional weights	1	1	1
14	Safety cabinet with laminar flow, Laminar flow apparatus-class –II model, ISI, with quality assured HEPA filtration,	1	1	1

15	Deionizer/ distillation apparatus	1	1	1
16	Binocular Microscope, with high resolution, A=/>1.25,plan achromatic	1	1	1
17	Refrigerator with double door - 285L	2	2	2
18	Vortex mixer	1	1	1
19	Millipore filtration unit	1	1	1
20	Lovibond comparator with phenol red and Bromothymol blue disc standard	2	2	3
21	Anaerobic Jar to contain 12 plates	1	1	2
22	Reuter Air Sampler	1	1	1

Glass wares, chemicals, reagents and miscellaneous items should be provided by the institute for the smooth conduct of Microbiology Laboratory.

C. Pathology Laboratory

Sl. No.	Name of the equipment	For batch of 30 students No	For batch of 40 students	For batch of 50 students
1	Microscope, rechargeable, LED monocular/binocularmicroscope, stain resistant enamel finished body, Fully anti fungal coated optical system with high resolution ,monocular head with 360 degree rotation ,wide field eye-piece-5x&10x/18mm. Double layer mechanical stage 120x120x/60x40 mm. Plan Achromatic/ apochromatic objective– (DIN) 4x,10x/15X, 40X &100X Oil immersion objective NA=/>1.25,wide field compensating eye-piece-5X&10X, and Abbes condenser with NA=/> 1.25,with iris diaphragm, blue filter , with battery back up for a minimum of 6 hours (preferably carton's student microscope/ equalent model) Quadruple nose-piece, S-LED illumination cool with adjustable illumination	30	40	50

	For BScMLT –Pathology- one microscope for each student			
2	Microtome with ISI/AO spensor with knives	2	2	3
3	Centrifuge ,Remi model/ISI, rotary head, bucket of 15 ml capacity, speed up to 10,000 rpm.	1	1	2
4	Heater with GI element	1	1	2
5	Water bath24x18"	1	1	2
6	Balance-Electronic (sensitivity10 mg)	1	1	1
7	Hot air oven 18x18x18"(1 No)	1	1	1
8	Lab incubator 24x24x24"	1	1	1
9	Distillation apparatus (All glass)/ Deionizer	1	1	1
10	Analytical balance	1	1	2
11	Haemocytometer	30	40	50
12	Haemoglobinometer	30	40	50
13	Colorimeter	2	2	3
14	Microtome ***	1	1	2
15	Microtome knife ****	1	2	2
16	Knife sharpener- -Hone&strop ***	1	2	2
17	Electronic balance senitivity – 1mg	1	1	2
18	Refrigerator 285L	1	1	1
19	Micropipette fixed volume	10	15	20
20	Micropipette variable volume	5	5	10
21	ESR stand & tubes- Wintrobes ESR stand & tubes- Westergren	30 30	40 40	50 50
22	Embeddingring& basemold ***	4	6	8
23	Tissue Flotation bath with temperature control ***	1	1	1

24	D C Counter	2	2	2
	*** To be available during fourth year course of newly started Collges / Institutions			

Glass wares, chemicals, reagents and miscellaneous items should be provided by the institute for the smooth conduct of Pathology Laboratory.

D. Computer laboratory

Sl. No.	**Name of the equipment**	For 30 students	**For 40 students**	For 50 students
1	Computer with UPS with sufficient software	10	15	20
2	Printer	1	1	2
3	Computer Chairs	10	15	20
4	Computer tables	10	15	20
	(Computer laboratory may be shared with other courses in the institute)			

Appendix- 3.4.2

Furniture required in Office room ,Staffs rooms, Class rooms , Library& Examination Hall

Office Table with cupboard - 20 nos

Chairs with arm rest - 20 Nos

Almirah - 10 Nos

Jefferson chair /table & chair/Desk& bench for 4 batch of students.

Principal 's office furniture

Executive Chairs

Chairs in the Visitor's Lounge

Almirah for keeping the text books in the Library

Chairs and Tables in the Library for 60 students

Chairs in seminar hall for 60 students

Examination Hall – Separate Examination tables & chairs for regular and supplementary students.

Appendix - 3.8.5

Average Clinical Laboratory facilities and specimens required in Hospital

SI No.	Clinical laboratories	Average number of Specimens / Month
1.	Biochemistry	4000
2.	Microbiology	750
3.	Clinical Pathology & Haematology	4000
4.	Blood Bank	200
5.	Histotechnology	400
6.	Cytology	200

Appendix - 3.8.6

Average number of specimens available per month for the following investigations in the clinical laboratory.

SI No.	Name of Specimen	Average number of specimens required
1.	Urine	500
2.	Stool	50
3.	Blood (Routine examination)	4000
4.	Blood- Biochemistry analysis including Hormones	6000

5	CSF & Other body fluids for various laboratory investigations	100
6.	Culture & Sensitivity	750
7.	Biopsy-Histopathology Investigations	400
8.	Cytology Specimen	150
9.	Blood for grouping & Rh typing	600
10.	Blood Transfusion	150

Appendix-2.3.6.1

Major equipment to be available in the ***hospital clinical laboratories*** for the training of BSc(MLT) students

No	Name of equipment	No.
1	Fully automated Biochemistry analyzer	1
2	Hematology analyzer	1
3	Blood coagulation Analyzer	
4	PCR machine	1
5	Fluorescent microscope.	1
6	ISE- electrolyte analyzer	1
7	Steam jacketed autoclave	1
8	ELISA reader	1
9	Reuter air sampler	1
10	Histokinete	1
11	Blood bank equipment including component separator	1
12	Deep freezer -20 degree C	1