

Pre Revision



TEERTHANKER MAHAVEER UNIVERSITY
(Established under Govt. of U.P. Act No.30, 2008) Delhi Road, Moradabad (U.P)

**Study & Evaluation Scheme
Of
Master of Science in Medical Laboratory Technology (M.Sc. MLT)**

Programme: Master of Science in Medical Laboratory Technology (M.Sc.MLT)

Duration: Two year (04 Semester) full time including six months Dissertation

Medium: English

Minimum Attendance Required: 75%

Maximum Credits: 75

Minimum Credits: 75

Assessment:

	Internal	External	Total
Theory	40	60	100
Practical	50	50	100

Internal Evaluation (Theory papers):

Class Test-I	Class Test-II	Class Test-III	Attendance	Assignment/ work book assignments & viva	Total
Best Two out of Three CTs					
10	10	10	10	10	40



Study & Evaluation Scheme

M.Sc. MLT (Clinical Haematology) - I Semester (I Year)

S. No.	Course Code	Subject	Period			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	MMLT-CH-101	Clinical Haematology	3	-	-	3	40	60	100
2	MMLT-CH-102	Immunohaematology & Blood Banking Techniques-I	3	-	-	3	40	60	100
3	MMLT-CH-103	Principles of Immunology	3	-	-	3	40	60	100
4	MMLT-CH-151	Practical: Clinical Haematology	-	-	2	1	50	50	100
5	MMLT-CH-152	Practical: Immunohaematology & Blood Banking Techniques-I	-	-	2	1	50	50	100
6	MMLT-CH-153	Practical: Principles of Immunology	-	-	2	1	50	50	100
7	MMLT-CH-154	Clinical Posting	-	-	18	9	50	50	100
		Total	09	00	24	21	320	380	600

Note: Two hours per week are designated for seminar and one hour per week is designated for library.



Study & Evaluation Scheme

M.Sc. MLT (Clinical Haematology) - II Semester (I Year)

S. No.	Course Code	Subject	Period			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	MMLT-CH-201	Clinical Haematology(Non-Neoplastic)	3	-	-	3	40	60	100
2	MMLT-H-202	Immunohaematology & Blood Banking Techniques-II	3	-	-	3	40	60	100
3	MMLT-CH-203	Biostatistics & Research Methodology	2	-	-	2	40	60	100
4	MMLT-CH-204	Principles of Laboratory Management, Automation & Quality Assurance	2	-	-	2	40	60	100
5	MMLT-CH-251	Practical- Non-Neoplastic Haematology-I	-	-	2	1	50	50	100
6	MMLT-CH-252	Immunohaematology & Blood Banking Techniques-II	-	-	2	1	50	50	100
7	MMLT-CH-253	Clinical Training	-	-	18	9	50	50	100
		Total	10	00	22	21	310	390	700

Note: Three hours per week are designated for seminar and one hour per week is designated for library.




Study & Evaluation Scheme

M.Sc. MLT (Clinical Haematology) - III Semester (II Year)

S. No.	Course Code	Subject	Period			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	MMLT-CH-301	Clinical Haematology (Neoplastic)	4	-	-	4	40	60	100
2	MMLT-CH-302	Cytogenetics & Molecular Diagnosis	4	-	-	4	40	60	100
3	MMLT-CH-303	General Pathology	2	-	-	2	40	60	100
4	MMLT-CH-351	Practical: Clinical Haematology (Neoplastic)	-	-	2	1	50	50	100
5	MMLT-CH-352	Practical: Cytogenetics & Molecular Diagnosis	-	-	2	1	50	50	100
6	MMLT-CH-353	Clinical Training	-	-	18	9	50	50	100
		Total	10	00	22	21	270	330	600

Note: Three hours per week are designated for seminar and one hour per week is designated for library.




Study & Evaluation Scheme

M.Sc. MLT (Clinical Haematology) - IV Semester (II Year)

S. No	Course Code	Subject	Period			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	MMLT-CH-451	Dissertation	0	0	24	12	100	100	200
	Total		00	00	24	12	100	100	200



M.Sc.MLT (Clinical Haematology)-I Semester (I Year)

Course/ Paper: Clinical Haematology

Course Code: MMLT-CH-101

L	T	P	C
3	0	2	4

Learning Objective: The curriculum of haematology aims to prepare the students in basic understanding of the composition of blood, their formation, instrumentation, techniques and methods of estimating different parameters .

Unit-I: Blood: its composition, function and formation, Hematopoiesis and hematopoietic tissue such as bone marrow, spleen, liver, thymus, lymph nodes, Red and yellow haematopoietic marrow, Mechanism of haemopoiesis, erythropoiesis, leucopoiesis (Granulopoiesis, monopoiesis, lymphopoiesis) and thrombopoiesis, role of haemopoietic growth factors, clinical use of growth factors, Anisocytosis and Poikilocytosis

Unit-II: RBC, its maturation and developmental stages, RBC membrane and its composition, RBC metabolism, red cell enzymes, role of BPG, HMP pathway, role of G-6-PD, Erythropoietin and its function

Haemoglobin , function, structure, types, variants of haemoglobin, acquired abnormal hemoglobins, Heme synthesis, Intravascular & extravascular hemolysis

Unit-III: Leucocytes, its type, morphology and function, Maturation and developmental stages of Neutrophil, Eosinophil, Basophil, Monocytes and Lymphocytes

Unit-IV: Platelets, its maturation and developmental stages, functions of platelets, structure of platelets, Primary hemostasis, role of blood vessels, Role of Platelets, Secondary hemostasis, Coagulation factors, physical & chemical properties of factors, classification of factors, coagulation cascade, coagulation inhibitory system & fibrinolysis

Unit-V: Anticoagulants, mechanism of action, advantages and disadvantages, effect of storage on blood cell, Blood collection method, Vacutainer, its type, uses and advantages

Haemoglobin by various methods, total, absolute and differential count, general blood picture, PCV/Hematocrit, ESR, Red cell indices, Platelet count, Reticulocyte count,

Bleeding time, Clotting time, PT, APTT, Clot retraction, Protamin sulfate test,

Principles, handling, care & maintenance and applications of cell counter, Coagulometer, ESR analyzer





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**Study & Evaluation Scheme
Of
Master in Optometry (M.OPTOM)**

Programme: Master in Optometry (M.OPTOM)
Duration: Two year (04 Semester) full time including one year Dissertation
Medium: English

Minimum Attendance Required: 75%

Maximum Credits: 97

Minimum Credits: 97

Assessment:

	Internal	External	Total
Theory	40	60	100
Practical	50	50	100

Internal Evaluation (Theory papers):

Class Test-I	Class Test-II	Class Test-III	Attendance	Assignment/ work book assignments & viva	Total
Best Two out of Three CTs					
10	10	10	10	10	40

Evaluation Dissertations/Project Reports:

Internal	External	Total
100	100	200

Duration of Examinations:



STUDY & EVALUATION SCHEME

FIRST SEMESTER

Sl. No.	Course Titles	Periods			Credit	Evaluation Scheme		
		L	T	P		Internal	External	Total
MCO101	Visual & Applied Optics	4	-	-	4	40	60	100
MCO102	Epidemiology & Community Eye care	4	-	-	4	40	60	100
MCO103	Research Methodology & Biostatistics	4			4	40	60	100
MCO104	Ocular Diseases and Diagnostics I	6			6	40	60	100
MCO151	Visual & Applied Optics Lab			2	1	50	50	100
MCO152	Ocular Diseases and Diagnostics Lab	-	-	2	1	50	50	100
MCO153	Clinic Posting (General)			12	6	50	50	100
TOTAL		18		16	26	310	390	700
Note:Two hour per week is designated for library.								

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SECOND SEMESTER

Sl. No.	Course Titles	Periods			Credit	Evaluation Scheme		
		L	T	P		Internal	External	Total
MCO201	Ocular Diseases and Diagnostics II	4	-	-	4	40	60	100
MCO202	Advanced Contact lens I	4	-	-	4	40	60	100
MCO203	Pediatric Optometry & Binocular vision	4	-	-	4	40	60	100
MCO204	Low Vision and Geriatric optometry	4	-	-	4	40	60	100
MCO251	Ocular Diseases and Diagnostics II Lab	-	-	2	1	50	50	100
MCO252	Advanced Contact lens I- Lab	-	-	2	1	50	50	100
MCO253	Pediatric Optometry & Binocular vision Lab			2	1	50	50	100
MCO254	Low Vision and Geriatric optometry Lab			2	1	50	50	100
MCO255	Clinic Posting (General)			12	6	50	50	100
TOTAL		16		20	26	270	490	900




THIRD SEMESTER

Sl. No.	Course Titles	Periods			Credit	Evaluation Scheme		
		L	T	P		Internal	External	Total
MCO301	Advanced contact lens II	5	-	-	5	40	60	100
MCO302	Low vision care and Rehabilitation	4	-	-	4	40	60	100
MCO303	Vision Therapy	6	-	-	6	40	60	100
MCO351	Advanced contact lens II Lab			2	1	50	50	100
MCO352	Low vision care and rehabilitation Lab			2	1	50	50	100
MCO353	Vision Therapy Lab	-	-	2	1	50	50	100
MCO354	Clinic Posting			12	6	50	50	100
TOTAL		15		18	24	320	380	700
Note: Two hours per week are designated for seminar and one hour per week is designated for library.								

FOURTH SEMESTER

Sl. No.	Course Titles		Periods			Credit			
			L	T	P	Evaluation Scheme			
						Internal	External	Total	
MCO 401	Education and Teaching Methodology	4	-	-	4	40	60	100	
MCO 402	Professional management Practice	4	-	-	4	40	60	100	
MCO 451	Education and Teaching-Methodology Lab	-	-	2	1	50	50	100	
MCO 452	Research Project (Dissertation)	-	-	24	12	100	100	200	
TOTAL			8		26	21	230	270	500
Note: Two hour per week is designated for library.									



Past Revision

Study & Evaluation Scheme

of

Master of Science in Medical Laboratory Techniques (M.Sc. MLT)

[Applicable W.E.F. Academic Session - 2019-20 till Revised]

[As per CBCS guidelines given by UGC]



TEERTHANKER MAHAVEER UNIVERSITY

N.H.-24, Delhi Road, Moradabad, Uttar Pradesh 244001

Website: www.tmu.ac.in



M.Sc.-MLT: Two Year (4-Semester) CBCS Programme

Basic Structure: Distribution of Courses

S.No.	Type of Course	Credit Hours	Total Credits
1	Core Course (CC)	2 Courses of 2 Credit Hrs. each (Total Credit Hrs. 2X2)	4
		1 Course of 3 Credit Hrs. (Total Credit Hrs. 1X3)	3
		1 Course of 4 Credit Hrs. each (Total Credit Hrs. 1X4)	4
2	Discipline Specific Course (DSC)	1 Course of 4 Credit Hrs. (Total Credit Hrs. 1X4)	4
		4 Courses of 3 Credit Hrs. each (Total Credit Hrs. 4X3)	12
3	Skill-Enhancement Elective Course (SEC)	7 Courses of 1 Credit Hrs. each (Total Credit Hrs. 7X1)	7
		3 Courses of 9 Credit Hrs. each (Total Credit Hrs. 3X9)	27
		1 Course of 12 Credit Hrs. (Total Credit Hrs. 1X12)	12
4	Compulsory Specified Course (CSC)	1 Course of 2 Credit Hrs. (Total Credit Hrs. 1X2)	2
Total Credits			75

Contact hours include work related to Lecture, Tutorial and Practical (LTP), where our institution will have flexibility to decide course wise requirements.

B. Choice Based Credit System (CBCS)

Choice Based Credit System (CBCS) is a versatile and flexible option for each student to achieve his target number of credits as specified by the UGC and adopted by our University.

The following is the course module designed for the MMLT program:

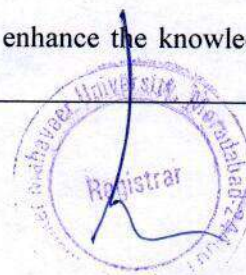
Core Course (CC): Core courses of MMLT program will provide a holistic approach to health care education, giving students an overview of the field, a basis to build and specialize upon. These core courses are the strong foundation to establish health related knowledge and provide broad multi-disciplined knowledge can be studied further in depth during the elective phase.

The core courses will provide more practical-based knowledge, case-based lessons and collaborative learning models. It will train the students to analyze, decide, and lead-rather than merely know-while creating a common student experience that can foster deep understanding, develop decision-making ability and contribute to the business and community at large. College offers four core courses from I-IV semester. Each CC ranges from 2-4 credits.

Skill Enhancement Course (SEC): These courses are designed to provide value-based and/or skill-based knowledge. College offer eleven SECs from I-IV Semester. Each SEC ranges from 1-12 credits.

Compulsory Specified Course (CSC): This is a compulsory course that does not have any choice and will be of 2 credits. Each student of MMLT program has to compulsorily pass this course.

Discipline specific course (DSC): These discipline specific courses helps to enhance the knowledge of the program. College offer five DSC courses ranging from 3-4 credits.



C. Programme Specific Outcomes (PSOs)

On completion of the Programme, the student will be:

PSO1.	Understanding and remembering areas like Blood banking, Blood Sample Matching, Hematology,
PSO2.	Applying techniques for collection and preservation of biological Samples.
PSO3.	Applying the fundamentals of research process to complete and present research studies that enrich the field of physical therapy.
PSO4.	Analysing proficient operation of automated haematology instruments, including instrument maintenance and QC.
PSO5.	Evaluating the results and explaining underlying principle in each investigation.

Pedagogy & Unique practices adopted: "Pedagogy is the method and practice of teaching, especially for teaching an academic subject or theoretical concept". In addition to conventional time-tested lecture method, the institute will emphasize on experiential learning.

1. Case Based Learning: Case based learning enhances student skills at delineating the critical decision dilemmas faced by organizations, helps in applying concepts, principles and analytical skills to solve the delineated problems and develops effective templates for health related problem solving. Case method of teaching is used as a critical learning tool for effective learning and we encourage it to the fullest.

2. Role Play & Simulation: Role-play and simulation are forms of experiential learning. Learners take on different roles, assuming a profile of a character or personality, and interact and participate in diverse and complex learning settings. Role-play and simulation function as learning tools for teams and groups or individuals as they "play" online or face-to-face. They alter the power ratios in teaching and learning relationships between students and educators, as students learn through their explorations and the viewpoints of the character or personality they are articulating in the environment. This student-centered space can enable learner-oriented assessment, where the design of the task is created for active student learning. Therefore, role-play & simulation exercises such as virtual share trading, marketing simulation etc. are being promoted for the practical-based experiential learning of our students.

3. Video Based Learning (VBL) & Learning through Movies (LTM): These days technology has taken a front seat and classrooms are well equipped with equipment and gadgets. Video-based learning has become an indispensable part of learning. Similarly, students can learn various concepts through movies. In fact, many teachers give examples from movies during their discourses. Making students learn few important theoretical concepts through VBL & LTM is a good idea and method. The learning becomes really interesting and easy as videos add life to concepts and make the

M.Sc.-Medical Lab Techniques CBCS Syllabus (w.e.f. 2019-20)





TEERTHANKER MAHAVEER UNIVERSITY
(Established Under Govt. of U.P. Act No. 30,
2008) Delhi Road, Bagadpur, Moradabad (U.P.)

<u>Study & Evaluation Scheme</u>	
<u>SUMMARY</u>	
Institute Name	Teerthanker Mahaveer University, College of Paramedical Sciences, Delhi Road, Moradabad
Programme	Master of Science in Medical Laboratory Techniques (M.Sc.MLT)
Duration	Two year (04 Semester) full time including six months Dissertation
Medium	English
Minimum Required Attendance	75%
<u>Credits</u>	
Total Credits	75

Eligibility for admissions:

A candidate seeking admission to M.Sc. MLT course must have passed bachelors degree of minimum 3 years duration in Medical lab Techniques with six months internship, recognized as equivalent by Teerthanker Mahaveer University, with not less than 50 % marks in aggregate.

Selection of eligible candidates:

Selection to the M.Sc. M.L.T., course shall be on the performance in written exam or interview conducted by Teerthanker Mahaveer University. Medical fitness certificate needs to be submitted by the candidate on the day of Admission.



Study & Evaluation Scheme

M.Sc. MLT (Clinical Haematology) - I Semester (I Year)

S.N	Category	Course Code	Course	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	DSC-1	MMLT-CH-101	Clinical Haematology	3	-	-	3	40	60	100
2	DSC-2	MMLT-CH-102	Immunohaematology & Blood Banking Techniques-I	3	-	-	3	40	60	100
3	CC-1	MMLT-CH-103	Principles of Immunology	3	-	-	3	40	60	100
4	SEC-1	MMLT-CH-151	Practical: Clinical Haematology	-	-	2	1	50	50	100
5	SEC-2	MMLT-CH-152	Practical: Immunohaematology & Blood Banking Techniques-I	-	-	2	1	50	50	100
6	SEC-3	MMLT-CH-153	Practical: Principles of Immunology	-	-	2	1	50	50	100
7	SEC-4	MMLT-CH-154	Clinical Posting	-	-	18	9	50	50	100
			Total	09	00	24	21	320	380	700

Note: Three hours per week are designated for seminar and one hour per week is designated for library

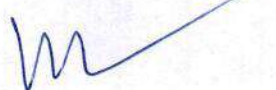



M.Sc. MLT (Clinical Haematology) - II Semester (I Year)

1

S. N	Category	Course Code	Course	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	DSC-3	MMLT-CH- 201	Clinical Haematology(Non-Neoplastic)	3	-	-	3	40	60	100
2	DSC-4	MMLT-CH-202	Immunohaematology & Blood Banking Techniques-II	3	-	-	3	40	60	100
3	CSC-1	MMLT-CH- 203	Biostatistics & Research Methodology	2	-	-	2	40	60	100
4	CC-2	MMLT-CH- 204	Principles of Laboratory Management, Automation & Quality Assurance	2	-	-	2	40	60	100
5	SEC-5	MMLT-CH- 251	Practical: Clinical Haematology(Non-Neoplastic)	-	-	2	1	50	50	100
6	SEC-6	MMLT-CH- 252	Practical : Immunohaematology & Blood Banking Techniques-II	-	-	2	1	50	50	100
7	SEC-7	MMLT-CH- 253	Clinical Training	-	-	18	9	50	50	100
			Total	10	00	22	21	310	390	700

Note: Three hours per week are designated for seminar and one hour per week is designated for library



M.Sc.- Medical Lab Techniques CBCS Syllabus (w.e.f. 2019-20)



M.Sc. MLT (Clinical Haematology) - IV Semester (II Year)

S. N	Category	Course Code	Course	Periods			Cre dit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	SEC-11	MMLT-CH-451	Dissertation	0	0	24	12	50	50	100
			Total	0	0	24	12	50	50	100