BACHELOR OF MEDICAL LABORATORY TECHNOLOGY (BMLT)

Academic Year: - 2019 onwards

Duration:- Three Year Degree Course (Six Semester).

Eligibility for Admission:-

Candidates seeking to Admission in Bachelor of Medical Laboratory Technology (BMLT) Course should have:

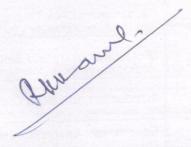
- Passed +2 /Intermediate Science with PCB or PCM
- Passed ANM Course
- Passed DMLT Course.

Objective of the course:-

- To impart advanced skill based education in the field of pathology.
- To enable them to take up higher courses of learning / specialization in field of Pathology.

Structure of the Course:-

The course will have six semesters and each semester will consist of 6 papers. Each paper carries 100 marks. The outline of the course is given as follows:





K. B. WOMEN'S COLLEGE, HAZARIBAG B. SC. MLT SYLLABUS SEMESTER- I

BM (Ge Ph)

Course Code / Subject Name	Unit	Topic	0
8MLT - 101	1	Basics of Human Anatomy-I	
General Human Anatomy & Physiology –I)	a) simue	Basics of Physiology-I	
	1	Human Healthcare and Safety Regulations	
on Bachelor of Walk Subserve	II	Introduction to Haematology and Routine tests	
BMLT - 102 Routine & Special Laboratory Fechniques-I)	III	Specimen Collection	
recriniques-i)	IV	Laboratory Preparation in Haematology	
	V	Sample processing and sterilization techniques.	
	1	Structure, Functions and Classification of Amino Acids and Proteins	
BMLT - 103	il	Structure, Functions and Classification of Carbohydrates	
(Biomolecules)	III	Structure, Functions and Classification of Lipids	
	IV	Physical and Chemical Properties of Nucleic Acids	
	1	Introductory Microbiology-1	
BMI T - 104	11	Morphology and Structure of Microorganisms	
(Fundamentals of Microbiology)	111	Recombinant DNA Technology	
	IV	Microbial Ecology and Biotic Interactions	
BMLT - 105	1	Introduction, Business Correspondence:	
(Communication Skills)	- 11	Government Correspondence, Writing Skills:	
	Pra	ctical	
BMLTP - 106	. 7	Practical of BMLT - 106	
	Total Cred	dits	

SEMESTER- II

Full Marks:100; Internal:20,	External:80
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3	Course Code (Co.)		Full Marks:100; Internal:20, Ext	ernal·80	
Cit	Course Code / Subject Name	Unit	Topic	Credi	
OIL	BMI.T - 201 (General Human Anatomy &	1	Basics of Human Anatomy-II	Orcui	
	Physiology –II)	II	Basics of Physiology-II	04	
H		1	Routine Haematological Tests		
		- 11	Urine Examination		
ı		111	Stool Examination	1,000	
	Routine & Special Laboratory	IV	Sputum and Semen Examination		
ľ	Techniques-II)	V	Basic Microbiology	04	
		VI	Introduction to serology		
		VII	Serological Tests		
	Land the second transfer in the second transf	VIII	Staining Techniques		
		- 1	Introduction to Computer	1 7 2 7 3	
	MLT - 203	Ш	Introduction to Microsoft Word		
	Basics of Computer Science)	III	Microsoft Power Point	04	
		IV	Introduction to Internet		
		V	Hospital Information System		
		1	Microbial Nutrition, Cultivation, Isolation and Preservation		
00 2	MILT - 204	11	Enzyme Regulation		
-	ficrobial Physiology -Metabolism	Ш	Microbial Metabolism -I	04	
		IV	Microbial Metabolism -II		
-		Practio	cal		
	BMLTP - 205		Practical of BMLT - 205	04	
	BMLTP - 206		Practical of BMLT - 206	.04	
	Total	Credits		24	

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SEMESTER-III

Full Marks:100; Internal:20, External:80

Course Code / Subject Name	Unit	Full Marks:100; Internal:20, Exter	Credit
Hopy I	1	Special Haematological Tests	Credi
tkymografic adrabit 1008			
BMLT - 301 (Haematology and Blood Banking-I)		Haemostasis & Bleeding Disorders Immunohaematology & Blood	04
The state of the s	111	Transfusion	
gast tacconscipt of	IV	Routine Lab Procedures in Blood Bank	
	1	Laboratory Diagnosis of Mycotic and Emerging Infections	
BMLT - 302 (Microbiology and Serology)	11	Diagnostic Microbiology	0.4
(111	Serology	04
	IV	Bacteriology	
The property of the	1	Miscellaneous Body Fluids	
	11	Biochemical Test Profile	
	III	Analytical Techniques	
BMLT - 303	IV	Biochemical Processes	
(Clinical Pathology and Biochemistry)	V	Carbohydrate Metabolism	04
	VI	Lipid Metabolism	
	VII	Protein Metabolism	
	VIII	Nucleic Acids	
nedsleek rodssullud nedrouk nedscheed	1	Infectious Diseases	
BMLT - 304	11	Microbes of Medical Importance	
(Pathogenic Microbiology)	III	Mode of Microbial Infections	04
	IV	Antimicrobial Drugs	
	Pract	ical	
BMLT P- 305		Practical of BMLT – 305	04
BMLT P- 306		Practical of BMLT - 306	04
To	otal Credits		24



1:80 Credit

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		arnal QA	
Unit	Full Marks:100; Internal:20, Exte	Credit	
1	Metabolic Disorders & Deficiency	- Journal of the second of the	
11	Clinical Endocrinology		
111	Body Fluid Specimen Processing	04	
IV	Blood Banking		
1	Introduction to Histology		
П	Tissue Processing		
111	Staining Procedures	04	
IV	Instrumentation in Histocytotechnology		
- 1	Medical Parasitology		
11	Common Intestinal worms		
III	Malarial parasites, Filarial parasites	. 04	
IV	Lab. diagnosis of Parasitic infections		
1	Student shall carry out Job Training & project work in consultation with industrial organizations.	04	
Practic	al		
	Practical of BMLT – 405	04	
	Practical of BMLT – 406	04	
Credits		24	
		I Metabolic Disorders & Deficiency II Clinical Endocrinology III Body Fluid Specimen Processing IV Blood Banking I Introduction to Histology II Tissue Processing III Staining Procedures IV Instrumentation in Histocytotechnology I Medical Parasitology II Common Intestinal worms III Malarial parasites, Filarial parasites IV Lab. diagnosis of Parasitic infections I Student shall carry out Job Training & project work in consultation with industrial organizations. Practical Practical of BMLT – 405 Practical of BMLT – 406	

SEMESTER- V

Course Code / Subject Name	Unit	Topic	(
yerresest a alabata de saction de la company.		Genetics	
BMLT - 501	11	CLIA techniques	
(Medical Genetics and Microbiology-II)	111	Immunology and Virology	
A part took	IV	Toxicology	
TOPS A Vigoreshi or nestpuborini i j	1	Exfoliative Cytology-Specimen Preparation	
BMLT - 502	II	Exfoliative Cytology- Staining Techniques	
(Histology & Cytology-II)	III	Exfoliative Cytology- Benign and Malignant Cells	
A CONTROL SERVICES OF SERVICE SOMERIES	IV	Advanced Instrumentation	
	1	Descriptive study of RBC abnormalities	
BMLT - 503 (Parasitology and Blood Cell	II	Disorders related to RBC	
Disorders-II)	111	Normal White Cell Count & Physiological variation	
	IV	Disorders related to WBC	
Security solution and the Market Security of	1	Pathogenic Microbes, Diagnosis, Prevention and Control	
BMLT - 504	II	Prevention and Control of Viral Diseases	
(Pathogenic Microbiology)	III	Human Mycotic Infections	
Entertaile to especial to the	IV	Mechanisms and Control of Parasitic Infections	
	Pract	ical	
BMLT P- 505	TOP OF ILE	Practical of BMLT - 505	
BMLT P- 506	770	Practical of BMLT – 506	
To	tal Credit	s	

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Course Code / Subject Name		Full Marks:100; Internal:20, Extern	nal:80	
and odder oubject Name	Unit	Topic	Cred	
BMLT - 601 (Clinical Laboratory Operations and Management)	1	Clinical Laboratory Operations and Management	04	
BMLT - 602 (Professional Training)	Professional Training for months at reputed hospit centre, pathology laborate institute pharmaceutical inc		08	
	1	X-ray		
	11	Ultrasound		
BMLT - 603 (Biomedical Imaging Devices & Concept)	III	Computed Tomography	04	
	IV	Magnetic Resonance Imaging		
	V	Endoscopy		
	Practio	cal		
BMLTP - 604		Practical of BMLT – 604	04	
BMLTP - 605		Practical of BMLT – 605	04	
Tota	al Credits	State of the state	24	

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Course	Unit	Topic	
BMLT – 101 (General Human		Introduction to: Anatomy, epithelial tissue, muscular tissue, nervous tissue. Skeletal System, Structure of bones, types of bones, Bones of cranium, face vertebral column upper and lower limbs. Circulation System, Structure of heart, names and position of main blood vessels. Lymphatic System, Lymph vessels, lymph nodes and lymphoid organs, their structure & functions. Respiratory System, Parts of Respiratory System.(diagram, Name, function) Brief introduction to vital organs in head, neck, thorax.	
Anatomy & Physiology –I)	11	Basics of Physiology- I Body fluids, Cardiovascular System. Circulation of blood function of heart and blood vessels. Control of heart rate blood volume. (Diagram of heart and Functions in details) ECG. Respiratory system.: Function of lungs, Respiration disorders like anoxia. dyspnea. lung function tests. Digestive Systems, Digestion of food in mouth, stomach small intestine. Absorption of food, function of live (formation of bilirubin & other functions in detail))- r

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SEMESTER- I

*	Course Code	Unit	Topic	Credit
r tissue, s, types n upper position les and (diagram in head, of blood. eart rate, details)-	BMLT – 102 (Routine & Special Laboratory Techniques- I)		Routine & Special Laboratory Techniques-I Human Healthcare and Safety Regulations Basic causes of accidents, common types of laboratory accidents. First aid in laboratory Medical care in India, Medical Laboratories of developing countries, Importance of Biomedical Waste. NABL. Organization of Laboratory Functional components of clinical laboratories, , precautions to be taken WRT patients ,reports, analysis. Communication between physician, patients, and the medical laboratory professional. Basic Laboratory Equipments Identification, use, maintenance and care of common laboratory glasswares and equipments, handling of all glasswares, principle and care of centrifuge, colorimeter, oven, incubator, microscope, Neubauer's chamber, Autoclave.etc. Cleaning of laboratory glasswares.	04
tomach & of liver.		II	Introduction to Haematology and Routine tests Components of blood and their functions, Haematopoietic systems of the body. Haemoglobin. Haematological Diseases Anaemia and various types of anemias, Leukemia, parasitic infections of blood. Routine haematological tests, RBC indices.	
		III	Specimen Collection Specimen collection & sample processing for haematological studies, anticoagulants and different vials-their advantages and disadvantages.	
		IV	Automation	

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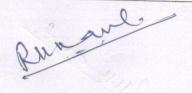
Course Code	Unit	Topic	Credit
BMLT – 103 Biomolecules		Introduction of biochemistry, carbohydrates- Introduction and definition, Classification- monosaccharides, disaccharides, oligosaccharides, polysaccharides. Isomerism and its classification. Deficiency & disorders-Glycosuria, Pentosuria, Diabetes mellitus, milk intolerance etc.	
	II Defi	Lipid- Definition, biological importance, Classification-simple lipid, compound lipid, derived lipid. Deficiency &disorders-Gaucher's disease, Tay- Sach's disease.	
	111	Amino acids- Introduction, physical properties of amino acids, Classification. Protein-Definition, biological importance, Classification- simple, conjugated & derived protein, Bonds relating to protein structure, structure of protein, denaturations of protein. Deficiency & disorders-Phenylketonuria (PKU), Alkaptonuria, Maple syrup urine disease, Malnutrition- Merasmus, scurvy.	
	IV	Nucleic Acids:- Structure & Properties of purine & pyrimidine bases Nucleosides & Nucleotides, Biologically important nucleotides Double helical model of DNA, Physical & Chemical Properties of nucleic acid. Deficiencies & disorders – Uric Acid, Gout.	1

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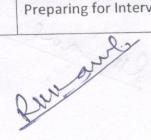
SEMESTER- I

Credit

Course Code	Unit	Topic	Credit
BMLT – 104 Fundamentals of Microbiology		Introductory Microbiology Introduction, scope and applications of Microbiology. Methods of Microbiology, isolation of pure cultures, theory and methods of sterilization. Microscopic examination of micro-organisms, bright field microscopy, dark field microscopy, phase contrast microscopy, electron microscopy. Staining of microbes, theory of Gram staining. Nature of Microbial World: Prokaryotes and eucaryotes.	Sicult
	II	Morphology and Structure of Microorganisms Morphology & fine structure of bacteria, fungi, actinomycete and algae. Organization of cell wall, cell membrane, flagella and capsules in bacteria. Morphogenesis in bacteria, formation of spores and cysts. Animal Viruses: Morphology and viral disease. Bacteriophages: Morphology, multiplication, detection and enumeration.	04
	,111	Recombinant DNA Technology Recombinant DNA technology, genetic engineering and gene cloning in micro-organisms. Bacterial genetics, Normal microbial flora of human body, Hospital acquired infection.	
	IV	Microbial Ecology and Biotic Interactions Symbiotic & non-symbiotic Nitrogen fixation biofertilisers & biopesticides. Sewage (waste-water) treatment, chemical characteristics, microbiological characteristics, waste water treatment processes.	



Course Code	Unit	Topic	Credit
BMLT – 105 Communication Skills		Unit-I: Introduction, Business Correspondence: Definition, Objectives, Stages of Communication, Essentials of Good/Effective Communication, Benefits of Good Communication, Gaps in Communication, Communication and information Technology. Structure of a Letter, Sales Letter, Order Letter, Compliant, Handling Telemarketing.	
		Unit-2: Government Correspondence, Writing Skills: Noting, Routine Letter, Official Letter Memorandum, Cicular, Telegrams, Newsletter. Report Writing, Scientific Paper Writing, Writing Small Paragraphs & Essays, Composition.	
		Unit-3: Grammar: Sentence Structure, Idiomatic Usage of Language, Tenses, Direct & Indirect Parts of Speech, Active & Passive Voice, Vocabulary.	04
		Unit-1: Selected Short Stories: 2-3 Classic short stories, 2-3 great short stories by Indian writers.	n
		Unit-5: Preparation for Job: Writing Applications for jobs, Preparing Curriculum Vitae Preparing for Interviews, Preparing for Group Discussions.	2,



B. SC. MLT SYLLABUS SEMESTER-I, PRACTICAL

Credit	Course	Unit	Experiment	Credit
	DMLT- 106		 To study the compound microscope and parts. Study of Epithelial, Muscle, Nerve and mammalian blood cells through permanent or temporary cells Study of the skeletal system of human beings To study human respiratory system - Slides To study human circulatory system - Slides To study human digestive system - Slides To separate the plasma and serum from given blood sample 	
04 e,		II	1. To indentify and to study applications of the different laboratory instruments. (A)Hot air oven. (B) Centrifuge. (C)Autoclave (D)Burettes & pipettes (E)Colorimeter (F)Neubauer's Chamber 2. Determination of haemoglobin concentration by sahil's method 3. Determination of haemoglobin concentration by cyanmeth. method 4. Determination of total erythrocyte(RBC) count 5. Determination of leukocyte (WBC) count 6. Determination of pack cell volume (PCV) 7. Determination of erythrocyte sedimentation rate (ESR) 8. Determination and calculation of red blood indices MCV, MCH, MCHC 9. Study of differential leukocyte count (DLC) 10. Determination of absolute Eosinophil count 11. Determination of platelet count	-(20
		III	 Principles and working of laboratory instruments Importance and methods of cleaning of glass apparatus Calibration of apparatus and glasswares Determination of blood sugar level of plasma (or serum) By glucose oxidase method Determination of serum creatinine: Alkaline picrate method. Determination of BUN (Blood Urea Nitrogen) Determination of serum bilirubin Estimation of lipids Estimations of protein 	- 6h

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	 Bacteria - culture plates, Slide, Viruses - microscopic images, fungi - Slides, Helminthes, Gross specimens - Tape worm, Round worm, Microscopy of cysts oya/parasites, protozoans - Slides. Staining-Gram's staining, acid fast staining, capsule staining, spore staining using prokaryotic and eukaryotic cells, hanging drop preparation.
IV	3. Preparation of culture media, spread plates, pour plates, selective media, differential media.
	4. Separation of pure cultures and study the effect of selective nutrients on prokaryotes.
	5. Isolation of Soil Bacteria, & Soil Fungi.
	6. Gel electrophoresis through photographs.
	7. Sterilization Techniques

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Course Code	Unit	Topic	Credit
IMLT201 Joneral Juman Anatomy, hysiology		Basics of Human Anatomy-II Brief introduction of Vital organs in the abdomen. Structure and function of Gastrointestinal system. Urinary System.: Parts of Urinary System.(name, Function) Unit I Endocrine System: Various endocrine glands. Thyroid. Parathyroid. Adrenal glands pituitary pancreas. Thymus and sex glands.(detail function of each gland & clinical significance) Reproductive System. Male & female Reproductive organs.(name & function) Nervous System.: Parts of brain, spinal cord, peripheral nerves.(function)	04
	II	Basics of Human Physiology-II Unit II Excretory System, Structure & function of kidney and urinary bladder. Mechanism of urine formation. disorders of kidney – Kidney function test. Reproductive System, Physiology of reproductive organs. Nervous System: Neurone & its function,.	

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Course Code	Unit	Topic	Credit
b brosensa	I management	Routinue Haematological Tests Determination of hemoglobin concentration ,determination of haematocrit , enumeration of formed elements ,calculations of red blood cell indices - MCV, MCH,and MCHC, study of blood smear , Reticulocyte count, Erytrocyte sendimantation rate (ESR) Eosinophil count , platelet count	
ament	II	Urine Examination Urine analysis- Physical, chemical & microscopic examination Clinical significance, specimen collection, laboratory investigation.	
BMLT 202 Routine & Special Laboratory Technology- II	III	Semen Examination - Semen analysis- Physical, chemical & microscopic examination Sputum Examination Collection, container, transport, preservation for sputum analysis. Physical, chemical and Microscopic examination and its significance.	
	IV	Basic Microbiology Classification, morphology and physiology of bacteria, growth requirement of bacteria, nutrients required. Gram positive & Gram negative Bacteria. Normal flora of human body.	
	V	Introduction to serology Structure and classes of Antigens and antibodies.	04
	VIII	Staining Techniques Gram positive & Gram negative Bacteria. Sputum test for AFB	

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Credit	Course Code	Unit	Topic	Credit
		oma a	BASICS OF COMPUTER SCIENCE COURSE OBJECTIVES: On completion of the course the students will be able to 3	2.001
		l Milgan hando Las mis e galacida	Comprehend the parts of a computer and the different operating systems Utilize the MS word for typing letters and to the difference and the diffe	
			 Utilize the MS word for typing letters and text Effectively use features in MS word to manipulate text and insert pictures and various fonts. 	
			4. Prepare and use effectively a Power Point presentation.	
			5. Utilize the internet for web searches and e-mail6. Appreciate the contribution of HIS to the healthcare industry	
	BMLT- 203 Basic Computer Science		7. Describe the uses of the hospital information system	04
			BASICS COMPUTER	
04			1. <u>Introduction to the Computer</u> : Parts of a Computer I/O devices – memories – RAM and ROM. Networking – LAN WAN, MAN (only basic ideas)	
			2. Introduction to Microsoft word: Typing text in MS work, manipulating text, formatting the text & using different font sizes. Bold italics. Using Bullets and numbering, insertion of pictures, & file insertion. Aligning of the text and Justify	
			3. Microsoft PowerPoint: Preparing new slides using MS-Power-Point. Inserting Slides, Slide transition and animation. Using templates, different text and font sizes. Inserting slides with sounds, inserting clip arts, Pictures, tables and graphs. Presentation using wizards.	•

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- 4. Introduction to the internet: Definition about the World Wide Web & brief history. Using search engine and beginning Google search-Exploring the next using Internet Explorer and Navigator- Uploading and Download of files and images E-mail ID creation Sending message Attaching files in E-mail.
- 5. Introduction to the Hospital Information
 System: Definition of Hospital Information
 system, Architecture of a HIS, aim and uses of HIS,
 Types of HIS Benefits of using a hospital
 information system.

BASICS OF COMPUTER (Practical)

- Introduction of Microsoft Word.
 Type a text document, save the document. Align
 the text with different formats using Microsoft
 Word. Inserting a table ensuring proper alignment
 of the table using MS word
- Microsoft Power-Point
 Preparing a slide show with transition, animation and sound effect using MS PowerPoint.
 Customizing the slide show by inserting pictures and tables in the slides using MS- PowerPoint.
- 3. Introduction to the Internet.

 Create an e-mail account. Use Internet to search for a subject of Internet.

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Course Code	Unit	Topic	Credit
	I	Microbial Nutrition, Cultivation, Isolation and Preservation Microbial Nutrition: Requirements for Growth. Physical requirement (Temperature, pH, osmotic pressure), chemical requirements (C, N, S, P, O). Culture Media: Chemically defined media, complex media, anaerobic growth media, selective & differential media, and enrichment culture. Cultivation of Aerobes and Anaerobes. Microbial Growth: Growth in population, bacterial growth curve, mathematical nature and expression, measurement of growth in bacteria.	
BMLT -204 Microbial Physiology - Metabolism	п	Enzyme Regulation Enzymes and their Regulation: Chemical and physical properties of enzymes. Nomenclature of Enzymes. Mechanism of enzymes action. Inhibition of enzyme action. Regulation of enzymes.	04
Metabolism	Ш	Microbial Metabolism –I Microbial Metabolism: Respiration and fermentation. Glycolysis, Pentose Phosphate pathway, the Entner-Doudoroff pathway, Tricarboxylic acid cycle.	
	IV	Microbial Metabolism –II Microbial Utilization of Energy & Biosynthesis: Transport of nutrient by bacteria. Biochemical mechanisms of generation of ATP. Gluconeogenesis, Phospholipids. Replication of DNA molecules, Transcription & Translation (process of protein synthesis). Bacterial Genetics: Conjugation, Transformation, Transduction (generalized transduction, specialized transduction).	

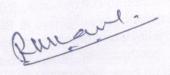
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Practical for Semester II

	Experiment	Unit	Credi	
SL. No.	BMLTP 205		04	
01	To measure the blood pressure of human being	910,021		
02	To measure the body weight and height and calculate BMI of a human (body mass index)			
03	Introduction to the word			
04	Introduction to the excel	15 - 17 15 22		
05	Introduction to the internet			
06	To prepare of the 1/10 N HCL			
07	Physical examination of urine			
08	Determination of specific gravity of urine by urinometer and refractormeter			
09	Chemical examination of urine.			
10	Microscopic examination of urine			
11	Physical and chemical examination of semen			
12	Microscopic examination of semen			
13	Physical examination of stool			
14	Chemical examination of stool			
15	Microscopic examination of stool			
16	Determination of reducing substances in stool			
17	Routine examination of sputum			
18	Preparation of sputum smear			
19	Gram's staining			
20	Study of motility of capsule			
21	Study of bacterial capsule .		* -	
22	Study of acid fast bacilli			
23	Study of malaria parasite			
24	Isolation of bacteria by streak plate techniques			
	To perform qualitative widal test			

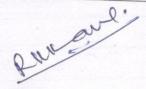
			T
	BMLTP 206		
01	Assay of serum alkaline phosphates		
02	Determination of SGPT		
03	Determination of SGOT		
04	Determination of Y-GT		
05	Inhibition of alkaline phosphatase by EDTA		
06	Use of ultraviolet light for its germicidal effect.	4	
07	Turbidimetric / spectrophotometric monitoring of growth using liquid cultures.		

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Semester III

Course Code	Unit	Topic	Credit
	1	Special Heamatological tests & factors in Haemoglobin synthesis & automation Screening of sickle cell anaemia, Estimation of foetal haemoglobin, Haemoglobin electrophoresis, Osmotic fragility test, Heinz body preparation, Laboratory diagnosis of protozone blood parasites, Lupus erythematosus (LE) cell preparation, Preparation of bone marrow smear for microscopic examination. Interpretation of lab findings in Haematology Anaemias, Leukaemias,	
BMLT 301 Hematology	II	Haemostasis & Bleeding Disorders Introduction to Haemostasis, & Mechanism of blood coagulation. Laboratory Investigation & Bleeding Disorders	
and Blood Banking-I	111	Immunohaematology & Blood Transfusion Principles of immunohaematology, Human blood group systems, & Rh type. Clinical significance of blood transfusion. Collection & Processing of blood for transfusion Preparation for blood collection, Blood collection, Transportation of blood after collection, storage of blood, Preparation and use of blood components.	
	IV	Routine Lab Procedures in Blood Bank Specimen collection for blood bank, General laboratory reagents in blood bank. Reporting of haemagglutination reaction. Antihuman globulin (AHG) & cross matching Transfusion reactions & Haemolytic Disease of a new born Blood transfusion process, Transfusion reaction, Haemolytic disease of the newborn.	,



Semester III

Course Code	Unit	Topic	Credit
	South Serving	Laboratory Diagnosis of Mycotic and Emerging Infections Introduction to Microbiology Disease oriented microbiology, culture & sensitivity test, aerobic, anaerobic techniques Laboratory Diagnosis of Mycotic infections Introduction to Fungi specimen collection, Laboratory diagnosis of mycotic infections, Diagnostic mycology	
	HI A ESTA	Diagnostic Microbiology & Micro Techniques Role of microbiology laboratory, specimen handling, laboratory records, safety Regulations, Quality control in microbiology, Lab Diagnosis of parasitic infections Collection and handling of faecal specimen, Laboratory techniques in parasitological investigation of stool, Lab identification of human parasites	
DMLT 302 Microbiology and Serology		Serology: Introduction & Serological Lab Procedures Principles of immunologic reactions, serodiagnosis. Collection and prepration of specimen, Serological test for syphilis (STS), Agglutination tests, C-reactive protein test (CRP), Rheumatoid arthritis test (RA), ASO, Immunologic test for pregnancy RIA, ELISA Parasitology Introduction, Protozoa, Helminths, Medical Entomology	04
	IV	Bacteriology Gram positive - streptococcus, staphylococcus, bacillus, mycobacterium, corynebacterium, Gram negative - E-coli, Klebsiella, Salmonella, shigella, Vibrio, Pseudomonas Diagnostic & Systemic Bacteriology Staphylococcus, Streptococcus, spirochaetes, mycoplasma, rickettsiae etc, idenifying characteristics of common pathogenic bacteria, Antimicrobial susceptibility test. Urease, catalase, geletine liquification, coagulase, oxidase, sugar fermentation, antibiotic sensitivity test.	

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Semester III

Course	Unit	Topic	Credi
	stankal andp mast ethick 	Miscellaneous Body Fluids Lab Examination of Miscellaneous Body Fluids Cerebrospinal fluid ,Laboratory investigation ,Serous fluids, Synovial fluid. Routine Biochemical Tests Phosphatases, transaminases, lactic dehydrogenase , Creatine kinase , Electrolytes ,Blood gases and bicarbonate, Determination of serum / plasma bicarbonate	
BMLT 303 Clinical Pathology and Biochemistry	dai perilai strama ni II stra II strama secolo her	Normal & Abnormal Biochemical processes of the body (Basic physiology and biochemistry of the body) Basic physiology and biochemistry of the body, Biochemical Test Profile Liver tests ,Renal tests, Endocrine function tests, Lipid profile, Transaminase, LDH, CPK, CPK-MB, SGPT/SGOT/Amylase.GTT	
	Ш	Normal & Abnormal Biochemical processes of the body Biochemical changes in the body under pathological conditions. Normal & Abnormal Biochemical processes of the body Functions of various organs and their clinical assessment	
2014 303 303 303 3001	V	Carbohydrate Metabolism Digestion & Absorption of Carbohydrates: Metabolic Pathways of Carbohydrates, Glycolysis and alcoholic fermentation, The Pentose Phosphate Pathway, Glucuronate and glyoxylate pathway, TCA cycle, Glycogenolysis & Glycogenesis, Gluconeogenesis.	04
	VI	Lipid Metabolism Digestion & Transport of Lipids: -Oxidation of fatty acids including odd chain fatty acids. α -and ω- oxidation of fatty acids Degradation of triglycerides and phospholipids. Formation and utilization of ketone bodies. Biosynthesis of triglycerides. Brief account of cholesterol & Prostaglandins.	,
	VII	Protein Metabolism Digestion of Proteins: General Reactions of Amino Acids: Deamination, transamination and decarboxylation. Urea cycle. Metabolic disorders in the urea cycle.	
	VIII	Nucleic Acids Nucleic Acids: Degradation of purines and pyrimidines. Catabolism of Heme & Formation of Bile pigments. Biosynthesis of heme. Conjugation of bilirubin and its clinical significance.	

Semester III

Course Code	Unit	Topic	Credit
(03)	T	Infectious Diseases Brief introduction to terminology of Infections diseases, Frequency of disease, Recognition of Infectious disease, Infections, Virulence and mode of transmission,	
		Microbes of Medical Importance Nomenclature and classification of microbes of medical importance. Origin of the Normal Flora, Germfree Life, Distribution and occurrence of Normai Flora of Skin, Eye, Respiratory Tract, Mouth, Intestinal Tract & Genitourinary Tract.	
DMLT 304 Pathogenic Microbiology	III	Mode of Microbial Infections Microbial adherence, Passive Penetration into body, Active Penetration into body, Events in Infection following penetration, Microbial virulence factors.	04
	IV	Antimicrobial Drugs Development of chemotherapy, General characteristics of antimicrobial drugs, factors influencing the effectiveness of antimicrobial drugs, Antibacterial drugs viz. sulfonamides, Quinolones, Penicillins, Cephalosporins, Tetracyclines, Erythromycin, Chloramphenicol, Drug Resistance, Antifungal and Antiviral drugs.	

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PRACTICAL SEMESTER III

Subject Code	Experiment	Credit
	(Hematology and Blood Banking-I)	Orean
	1. To study sickling test using 2% sodium metabisulphite	
	2. Determination of reticulocyte count.	
	3. Determination of prothrombin time, APTT.	
	4. Determination of glucose-6-phosphate dehydrogenase(G-6-PD)	
	5. Determination of serum sodium and potassium	
	6. Determination of serum chloride	
	7. Determination of bleeding time	
	8. Determination of blood clotting time	
BMLTP-305	1.capillary method 2.tube method	
DIAIT 11-202	9. Qualitative test for ABO grouping with antisera by slide method	04
	10. Qualitative test for ABO grouping with antisera by tube method	
	11. Qualitative test for Determination of D (Rh) antigen on human red	
	blood cells.	
	1.tube method 2.slide method	
	12. To perform cross matching test by saline-tube method	N
	13. To perform direct coomb's test	
	14. To perform indirect coomb's test	
	15. Determination of the anti-D antibody titer	
	antibody titer	
	(Clinical Pathology and Biochemistry)	
	1. Estimation of blood sugar level of plasma (or serum)	
	By glucose-oxidase method	
	2. To perform pregnancy test by dipstick method	
	3. Estimation of blood urea nitrogen.	
	4. Estimation of serum creatinine.	
	5. Determination of proteins	
	6. Determination of serum bilirubin.	
	7. Estimation of serum total cholesterol.	
	8. Determination of serum glutamate pyruvate transaminase(SGPT) and	
	serum glutamate oxaloacette tranasaminase(SGOT)	
	9. Determination of serum alkaline phosphatase	
	10. To perform glucose tolerance test	
BMLTP-306	Metabolism	04
	1. Estimation of Ca+ in serum	
	2. Estimation of total lipids in serum.	
	3. Estimation of Lipoproteins	
	Estimation of inorganic phosphate.	
	Pathogonia Mianakiala	
	Pathogenic Microbiology	
V	1. Stainings – Gram's, Alberts, ZN.	
	2. Isolation and Maintenance of Pure Cultures.	
	3. Physiological characteristics of bacteria and identification.	
	4. Preparation of serum/plasma.	
	5. Sterilization - Introduction to autoclave, hot air oven, filter	
	sterilization.	
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Semester IV

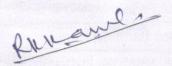
Course Code	Unit	Topic	Credit
	1	Metabolic Disorders & Deficiency Diagnostic Test profile ANC, Arthritis, Cardiac, Hypertension, Anaemia.	04
BMLT 401	11	Clinical Endocrinology Hormonal studies & Clinical Endocrinology Thyroid, Pancreas, Adrenal & Sexual glands, hormones & it's diagnostic significance.	
Clinical Blochemistry and Microbiology-I	. 111	Body Fluid Specimen Processing Specimen processing for biochemical analysis Blood, Urine, Cerebrospinal fluid, Body fluids Automation in Clinical Biochemistry Laboratory Classification of automated systems, steps of automation in biochemical analysis, some commonly used automated analysers of biochemical laboratories	
	IV	Blood Banking Organization, operation, administration of blood bank and maintenance of records, government regulation (FDA)	
BMLT -402 Riotology-Cytology	1	Introduction to Histology Introduction to Histology & Cytotechnology Basic terminology, Laboratory equipments for histology and cytology, Use and care of frequently used equipments, Preparation of reagent solutions	
	II	Tissue Processing Lab techniques in histology: Tissue Processing Logging of specimen, preparation of tissues, processing of tissues, Handling and embedding of small tissue fragments.	
	111	Staining Procedures Lab techniques in histology: Staining Procedures Routine staining procedure in histotechnology, special stains and staining techniques, stains for particular substances	04
	IV	Instrumentation in Histocytotechnology Autoanalyser, Tissue Processor, Microtome	
BMLT - 403	1	Medical Parasitology	04
Parasitology and Blood Cell	II	Common Intestinal worms	
Disorders-I	III	Malarial parasites, Filarial parasites	
	IV	Lab. diagnosis of Parasitic infections	
BMLT 404 (Job Training & Project Report)	1	Student shall carry out Job Training & project work in consultation with industrial organizations. This paper will be of 200 Marks.	04

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B. SC. MLT SYLLABUS PRACTICAL SEMESTER IV

Subject Code	Experiment	Cred
BMLTP 405	 Routine examination of peritonea! (ascitic) fluid Routine examination of pleural fluid Routine examination of synovial fluid Routine examination of CSF Chemical examination of CSF Chemical examination of CSF To determine uric acid in serum To determine uric acid concentration of urine. To estimate serum calcium and phosphorus To estimate the concentration of Serum amylase & Lipase To estimate the concentration of CPK total and LDH To determine serum acid phosphatase Determination of antistrptolysin O(ASO) To perform C-reactive protein test (CRP) Introduction to chromatography Routine examination of feces. Physical examination of stool. Microscopic examination of stool specimen. Detection of malarial parasite Detection of trypanosomes(the casual agent of sleeping sickness) Laboratory diagnosis of kala azar Laboratory diagnosis of microfilaria(wuchereeia bancrofti) Quantitative determination of serum (or plasma) IgG class antibodies by ELISA Determination of IgM class antibodies by ELISA 	04
BMLTP 406	 Separation and identification of amino acids by (i) Paper chromatography (ii) Thin layer chromatography. Estimation of lactic acid in blood. Antigen-antibody interactions Agglutination Precipitation Blood grouping 	04



Semester - V

it	Course Code	Unit	Topic	Credit
redit	BMLT 801 Medical Genetics and Microbiology- II	1	Introduction to Medical Genetics (Structures of DNA RNA). Genetic of common diseases.	
		- 11	Immunology and Virology Immunity/Immune system, innate immunity, adaptive immunity, cells and oragans involved in immune system Virology General characteristics of Viruses, classification of viruses, Oncogenic Viruses, RNA/DNA Viruses,AIDS, Structure of viruses, lysogenic cycle, lytic cycle, smallpox, polio, HIV,Hepatitis B	04
	BMLT	1	Prepration of specimens for cytological evaluation,	04
04	802	- 11	Cytological stains and staining techniques,	
	Mistology- Cytology -II	111	Charecteristics of benign and malignan cells	
	Cytology -11	IV	Descriptive study of RBC abnormalities	
	DMLT 503 Paranitology and Blood Coll		Disorders related to RBC Disorders related to RBC	
			04	
	BMLT 604 Pathogenic Microbiology	ESER 1	Pathogenic Microbes, Diagnosis, Prevention and Control Introduction to important diseases caused by Streptococcus, Pneumococcus, Neisseria, Corynebacterium, Bacillus, Ciostridium, enterobacteriaceae (Proteus, Shigella, Salmonella), Vibrio, Yersinia, Hemophilus, Mycobacterium, laboratory diagnosis, prevention and control of these diseases.	
04		11.	Prevention and Control of Viral Diseases Morphology, pathogenesis, laboratory diagnosis, prevention and control of viral diseases viz. Rabies, Polio, Small pox, Herpes, Measles, Influenza and AIDS.	
		III	Human Mycotic Infections Introduction to Human mycotic infections, Dermatophytosis, Blastomycosis, Candidiasis and Aspergillosis.	04
		IV	Mechanisms and Control of Parasitic Infections Life cycle, pathogenic, mechanisms and control of parasitic infections viz. amoebiasis, Kala-azar, toxoplasmosis, ascariasis, filarasis, hook worm infections.	

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B. SC. MLT SYLLABUS PRACTICAL SEMESTER V

Subject Code	Experiment	Credit
7 7 25 PART	 To detect hepatitis-B surface antigen(HBsAg) To detect HIV antibodies To determine TSH, T3 & T4 	
BMLT P505	Tissue processing by using tissue processor 1. Sharpening of the microtome knife 2. Gross examination and fixation of the specimen 3. Processing of the tissue by manual method 4. Section cutting of paraffin wax embedded tissue 5. To fix the section on the slide 6. Staining of the tissue section by using hematoxylin and eosin staining method	04
BMLTP 506	 Preparation of staining of blood smear Study of morphology of blood cells Blood cells disorder in leukemia Determination of osmotic fragility of red blood cells Determination of foetal hemoglobin. Preparation of lupus erythromatosus(LE) cell Preparation of Heinz bodies Microscopic examination of bone marrow smear Laboratory tests for diagnosis of aplastic anemia Investigations of megaloblastic anemia Laboratory tests in iron deficiency anemia Laboratory test for diagnosis of hemolytic disorders. Identification of both gram positive and gram negative 	04
	microorganisms on the basis of: (i) Morphology. (ii) Bio-chemical characteristics. (iii) Serological reactions. 2. Demonstration of pathogens (Viruses, fungi, parasites) in permanent mounted slides. 3. Demonstration of cysts/ovas of protozoa/Helminths.	

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Semester VI

Stool examination, Stool examina	04
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B. SC. MLT SYLLABUS PRACTICAL SEMESTER VI

Subject Code	Experiment	Credit
BMLTP 604	 Quality control – Experiments and viva on quality control. Calibration and validation of Lab instrument/analyzers Preparation of reports. Biomedical waste disposal Lab ethics and Audit in Medical lab. 	4
BMLTP 605	Project report and viva on profession training.	4

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