

Government Polytechnic Sector-26 (Panchkula)

Lesson Plan

Name of the Faculty: Miss. Riya

Discipline : MLT

Semester : 3rd

Subject : APPLIED CLINICAL BIOCHEMISTRY

Lesson Plan : Workload (lecture/practical)per week(in hours):Lectures-03,
practicals-04

week	Theory		Practical	
	Lecture day	Topics (including assignment/test)	Practical day	Topics
1	1	Serum Bilirubin-Formation and excretion of bilirubin	1	Serum bilirubin estimation
	2	Formation of bile pigments		
	3	Conjugated and unconjugated bilirubin		
2	4	Principle and procedure of direct bilirubin estimation	2	Phosphorus estimation
	5	Principle and procedure of indirect bilirubin estimation		
	6	Reference values & Clinical importance		
3	7	Assignment -1	3	Calcium estimation
	8	SGOT and SGPT (AST and ALT) introduction		
	9	Principle and procedure of estimation SGOT		
4	10	Principle and procedure of estimation SGPT	4	Renal clearance tests
	11	Reference values & Clinical importance		
	12	Assignment-2		
5	13	ALP and ACP introduction	5	SGOT estimation
	14	Principle and procedure of estimation ALP		
	15	Principle and procedure of estimation ACP		

6	16	Reference values & Clinical importance	6	SGPT estimation
	17	Assignment -3		
	18	Test 1,2,3 unit		
7	19	Serum Amylase introduction	7	ALP estimation
	20	Principle and procedure of estimation		
	21	Reference values & Clinical importance		
8	22	Assignment - 4	8	ACP estimation
	23	Serum calcium and phosphorus introduction		
	24	Principle and procedure of estimation for Serum calcium		
9	25	Principle and procedure of estimation for Serum phosphorus	9	Total cholesterol estimation
	26	Reference values & Clinical importance		
	27	Assignment - 5		
10	28	Lipid profile introduction, formation of cholesterol	10	Triglyceride estimation
	29	HD and LD cholesterol		
	30	Principle and procedure for cholesterol estimation		
11	31	Ref. value and clinical importance	11	Estimation of HDL and calculation of VLDL and LDL
	32	Triglycerides, principle and procedure for estimation		
	33	Importance of various ratios of HDL, LDL and VLDL		
12	34	Test 4,5,6	12	Urinary protein estimation
	35	Urinary proteins and creatinine introduction		
	36	24hr. urinary proteins estimation		
13	37	24hr. urinary creatinine estimation	13	Urinary creatinine estimation
	38	Ref. values and clinical significance		
	39	Assignment - 6		
14	40	Renal function test introduction	14	Estimation of serum amylase
	41	Urea clearance test		
	42	Creatine clearance test		
15	43	Clinical significance	15	LDL estimation

	44	Revision		
	45	Revision		
16th	46	Characteristics of good film preparation	L16	
	47	Staining procedure of Romanowsky stains		
	48	Examination of blood smear, Identification of blood cell		

Lesson Plan

Name of the Faculty : Ms Pratima Saini

Discipline : MLT

Semester : 3rd

Subject : Clinical Haematology -I

Lesson Plan Duration: 16weeks (from July, 2026 to November, 2026)

Work load (Lecture / Practical) per week (in hours) = Lecture=3, Practical=8)

WORK	THEORY		Practical	
	Lecture Day	Topic (Including assignment/test}	Practical Day	Topic
1 st	1	Introduction to Erythrocyte sedimentation rate (ESR)	L1	ESR estimations by wintrobe method in blood sample
	2	Westergren's method of ESR estimation		
	3	Wintrob's method of ESR estimation		
2 nd	4	Introduction to packed cell volume (PCV)	L2	ESR estimations by westergren method in blood sample
	5	Macrohaematocrite method of PCV estimation		
	6	Microhaematocrite method of PCV estimation		
3 rd	7	Merits and Demerits of ESR & PCV estimation	L3	Determination of PCV in blood by Macro Methods
	8	Factors involved in ESR& Interpretation of results		
	9	Clinical Significance of ESR &PCV estimation		
4 th	10	Assignment	L4	Determination of PCV in blood Micro Methods
	11	Test		
	12	Introduction to Red Cell Indices		
5 th	13	Definition, reference range of MCV	L5	Counting of Reticulocyte in blood
	14	Calculation and interpretation of MCV		
	15	Definition, reference range of MCH		
6 th	16	Calculation and interpretation of MCH	L6	To perform red cell fragility test on blood by osmotic fragility method
	17	Definition, reference range of MCHC		
	18	Calculation and interpretation of MCHC		
7 th	19	Assignment	L7	To perform red cell fragility test on blood by mechanical fragility method
	20	Introduction to Supravital stain and reticulocyte counting		

	21	Principle and procedure of staining		
		reticulocytes		
8 th	22	Calculation, Reference values and interpretation of Reticulocytes count	L8	To perform Sickling test on blood by solubility test
	23	Physiological Values of Hb		
	24	Physiological Values of PCV		
9 th	25	Physiological Values of TLC	L9	To perform Sickling test on blood by peripheral blood film
	26	Physiological Values of Platelet count		
	27	Definition & Symptoms of Anaemias		
10 th	28	Introduction to aetiological classification of Anaemia	L10	Estimation of foetal haemoglobin by alkali denaturation test
	29	Introduction to morphological classification of Anaemia		
	30	Haemorrhagic & Dyshaemorrhagic anaemia in detail		
11 th	31	Microcytic anemia & Megaloblastic anemia	L11	Estimation of plasma haemoglobin by Sahli's method
	32	Haemolytic Anaemia in Detail		
	33	Aplastic anemia in Detail		
12 th	34	Laboratory diagnosis of: Iron deficiency anaemia	L12	Estimation of plasma haemoglobin by Cyanmethemoglobin method
	35	Laboratory diagnosis of Megaloblastic anaemia		
	36	Laboratory diagnosis of Haemolytic anaemias		
13 th	37	Laboratory diagnosis of sickle cell anaemia & thalassemia	L13	Estimation of plasma haemoglobin by Oxyhemoglobin method
	38	Laboratory diagnosis of Aplastic anaemia		
	39	Assignment		
14 th	40	Test	L14	Estimation of plasma haemoglobin by Alkaline hematin method
	41	Introduction to Red cell fragility		
	42	Mechanical erythrocyte fragility test		
15 th	43	Osmotic erythrocyte fragility test	L15	Estimation of and G6PD by Methylene Blue Reduction Test
	44	Interpretation & Significance of Red Cell Fragility		
	45	Assignment		
16 th	46	Revision	L16	Viva Voice
	47	Revision		
	48	Revision		

Lesson Plan

Name of the Faculty : Expert

Discipline : MLT

Semester : 3rd

Subject : Histopathology

Lesson Plan Duration: 16 weeks (from July, 2026 to November, 2026)

Workload (Lecture/Practical) per week (in hours) =Lecture=3, Practical=8

WORK	THEORY		Practical	
	Lecture Day	Topic(Including assignment/test}	Practical Day	Topic
1 st	1	Introduction and definition of : Histology, Histopathology Biopsy, Autopsy, Autolysis, Putrefaction	L1	Reception of specimen, labeling and preserving the specimen
	2	Tissue Preparation method Unfixed Tissue preparations: Imprint methods, Teased preparation, Squashed preparation, Frozen section		
	3	Fixed Tissue preparations: Paraffin embedding, Celloidin embedding, Gelatin embedding		
2 nd	4	Reception of Specimen: Reception, recording, labeling and preservation of histological specimen	L2	Preparation of different fixatives with special emphasis on preparation of formaline based fixatives
	5	Introduction about Fixation		
	6	Classification of fixatives: Composition of various fixatives		
3 rd	7	Advantages and disadvantages of fixative	L3	Preparation of paraffin blocks from various tissue pieces and labeling with emphasis on orientation
	8	Processing of tissue		
	9	Different steps of tissue processing: Dehydration, Clearing/ Dealcoholization		
4 th	10	Infiltration and impregnation Paraffin embedding	L4	Handling of microtome
	11	Paraffin Embedding, Mountants		
	12	Various types of mounting media (aqueous, resinous), Advantages and Disadvantage		
5 th	13	Introduction about Microtomy and Microtome	L5	Sharpening of microtome

	14	Types of microtome		knives
	15	Advantages and disadvantages of microtome		
6 th	16	Working principle ,Care and maintenance of microtome	L6	Preparation of blocks for fine cutting - Rough cutting - Trimming
	17	Histokinete (automatic tissue processor) - its types, working, care and maintenance		
	18	Microtome Knives(plan concave, wedge, bioconcave ,edge)		
7 th	19	-Sharpening of knives - Honing technique Stropping technique	L7	Practice off inesection cutting
	20	Automatic knife sharpener–uses, care and maintenance -Uses of abrasives and lubricants		
	21	Introduction to Section Cutting, Rough cutting, Fine cutting		
8 th	22	Use of tissue floatation bath	L8	Practice of lifting of sections on the slides
	23	Use of various adhesive media and lifting of Sections to the slide		
	24	Errors/cutting faults in sections and their remedies		
9 th	25	Assignment	L9	Performing H&E staining on sections and mounting of tissue sections
	26	Test		
	27	Introduction about Exfoliative Cytology		
10 th	28	Preparation of vaginal & cervical smears	L10	Demonstration of cell using buccal smear/urine sample
	29	Urine Collection and Processing of specimen for cytology		
	30	Sputum Collection and Processing of Specimen for cytology		
11 th	31	CSF(Cerebrospinal Fluid) Collection and Processing of specimen for cytology	L11	Processing of urine samples for malignant cells
	32	Introduction about Cytological Specimen Fixation		
	33	Various types of Cytological fixatives		

12 th	34	Advantages and Disadvantages	L12	Processing of sputum sample for malignant cytology
	35	Progressive and regressive staining Use of controls in staining and their significance		
	36	Introduction about Cell Definition and function of cell		
13 th	37	Cell Structure and Multiplication(Mitosis and Meiosis)	L13	To perform PAP stain on given smear
	38	Assignment		
	39	Test		
14 th	40	Introduction about Cytological Staining	L14	To perform MGG & H&E stain on given smear
	41	Principle, Technique and interpretation of results in -Papanicalaou staining		
	42	Principle, Technique and interpretation of results in -May Grunewald & Giemsa staining		
15 th	43	Revision	L15	To demonstrate various automation by use of brochures, charts etc.
	44	Revision		
	45	Revision		
16 th	46	Revision	L16	Viva Voice
	47	Revision		
	48	Revision		

Lesson Plan

Name of the Faculty : Expert

Discipline : MLT

Semester : 3rd

Subject : Parasitology and Virology

Lesson Plan Duration : 16 weeks (from July, 2026 to November, 2026)

Work load (Lecture / Practical) per week (in hours) = Lecture=3, Practical=8

WORK	THEORY		Practical	
	Lecture Day	Topic (Including assignment/test}	Practical Day	Topic
1 st	1	Introduction to Parasitology	L1	Collection and routine stool examination for detection of intestinal parasites by Saline preparation
	2	General characteristics, morphology of Protozoa		
	3	Classification of Protozoa		
2 nd	4	General characteristics, morphology of Helminthes	L2	Collection and routine stool examination for detection of intestinal parasites by Iodine preparation
	5	classification of Helminthes		
	6	Collection, transportation, processing and preservation of blood sample for routine investigations		
3 rd	7	Collection, transportation, processing and preservation of stool sample for routine investigations	L3	Collection and routine stool examination for detection of intestinal parasites by Floatation method (saturated salt solution/zinc sulphate)
	8	Introduction about Concentration techniques		
	9	- Principle and application of concentration techniques(floating techniques)		
4 th	10	Simple floating technique	L4	Collection and routine stool examination for detection of intestinal parasites by Centrifugation method (formal ether)
	11	DCF technique		
	12	Sedimentation techniques(simple)		
5 th	13	Sedimentation techniques(formalin ether)	L5	Identification of Tapeworm from preserved specimen/slides

	14	Introduction about Giardia and Morphology of Giardia		
	15	Life cycle and Lab diagnosis of Giardia		
6 th	16	Morphology and Life cycle of Entamoeba histolytica	L6	Identification of Roundworm from preserved specimen/slides
	17	Lab diagnosis of Entamoeba histolytica		
	18	Morphology and Life cycle of Ancylostoma		
7 th	19	Life cycle and Lab diagnosis of Ancylostoma	L7	Identification of Hookworm from preserved specimen/slides
	20	Morphology of Ascaris lumbricoides		
	21	Life cycle and Lab diagnosis of Ascaris lumbricoides		
8 th	22	Assignment	L8	Identification of Pinworm from preserved specimen/slides
	23	Morphology and life cycle of T solium,		
	24	Lab diagnosis T solium,		
9 th	25	Morphology and life cycle of T saginata	L9	Identification of Trichomonas vaginalis from preserved specimen/slides
	26	Lab diagnosis T saginata		
	27	Introduction about Malarial Parasite		
10 th	28	Morphology of P. Vivax	L10	Preparation of stains (Leishman, Giemsa, Field)
	29	Life cycle of P. Vivax		
	30	Lab diagnosis of P. Vivax		
11 th	31	Morphology of P. Falciparum	L11	Preparation of thin and thick smears
	32	Life cycle of P. Falciparum		
	33	Lab diagnosis of P. Falciparum		
12 th	34	Assignment	L12	Staining of smears by Leishman, Giemsa, Field
	35	Introduction about Virology		
	36	General Characteristics of virus		
13 th	37	Structure of viruses.	L13	Examination of smears for malarial parasite (P. vivax)
	38	Classification of virus		
	39	Lab diagnosis and prevention of – - Rabies - Polio		
14 th	40	Lab diagnosis and prevention of – HIV , HBV (Hepatitis ‘B’ virus)	L14	Examination of smears for malarial parasite(P. falciparum)

	41	Introduction about Virological Samples		
		- Collection of Virological Samples - Transportation - Storage		
	42	Transportation of virological samples		
15 th	43	Storage of virological samples	L15	Demonstration of various stages of malarial parasite from stained slides
	44	Assignment		
	45	Test		
16 th	46	Revision	L16	Viva
	47	Revision		
	48	Revision		

Lesson Plan

Name of the Faculty : Expert

Discipline : MLT

Semester : 3rd

Subject : Transfusion Medicine

Lesson Plan Duration: 16 weeks (from July, 2026 to December, 2026) Work

load (Lecture / Practical) per week (in hours) = Lecture=3, Practical=4

WORK	THEORY		Practical	
	Lecture Day	Topic (Including assignment/test)	Practical Day	Topic
1 st	1	Historical introduction to Transfusion medicine (blood banking)	L1	Performing ABO blood grouping by Slide & Tube Test
	2	Definition of antigen and antibody		
	3	Classification of antigens		
2 nd	4	Classification of antibodies.	L2	Performing-Rh grouping by Slide & Tube technique
	5	Introduction to ABO blood grouping		
	6	Antigens and antibodies involved in ABO blood grouping		
3 rd	7	Principle and procedure of ABO blood grouping Slide method	L3	Performance of Coombs Test by Direct method
	8	Principle and procedure of ABO blood grouping Tube method		
	9	Various blood sub groups (A ₁ ,A ₂ , A ₁ B, A ₂ B)		
4 th	10	Assignment	L4	Performance of Coombs Test by Indirect method
	11	Introduction to Rh Blood Group System		
	12	Antigen and antibody involved in Rh blood grouping		
5 th	13	Principle and procedure of Rh grouping	L5	Cross Matching (compatibility testing) by Major testing
	14	Variant of D antigen		
	15	Types and composition of various anticoagulants		
6 th	16	Advantages and disadvantages of various anticoagulants	L6	Cross Matching (compatibility testing) by Minor testing
	17	Criteria for selection of Donor		
	18	Screening of blood donor for Blood Collection and storage		
7 th	19	Characteristics of ideal blood donor.	L7	Preparation of anticoagulants – ACD (Acid Citrate Dextrose) –
	20	Blood collection procedure		

	21	Transportation and storage		CPD (Citrate Phosphate Dextrose) - CPDA (Citrate Phosphate Dextrose Adenine)
8 th	22	Screening of blood donors for MP	L8	Malarial Parasite test by Thick smear preparation
	23	Staining of blood film for MP		
	24	Slide test for VDRL		
9 th	25	VDRL Buffer Saline test	L9	Malarial Parasite test by Thin smear preparation
	26	ELISA based HIV test		
	27	Western Blot test for HIV		
10 th	28	Screening of blood donors for HbsAg & HCV	L10	VDRL Test
	29	Assignment		
	30	Introduction to Cross Matching		
11 th	31	Major Cross Matching	L11	HIV Test
	32	Minor Cross Matching		
	33	Saline method for cross matching		
12 th	34	Albumin& Albumin globulin test method for cross matching	L12	HbsAg Test
	35	Assignment		
	36	Introduction to Coombs Test		
13 th	37	Principle, procedure of Indirect coombs test	L13	HCV Test
	38	Importance and application of Indirect coombs test		
	39	Principle, procedure of Direct coombs test		
14 th	40	Importance and application of Direct coombs test	L14	Preparation of platelet rich plasma
	41	Preparation,Preservation&Uses of Packed cells		
	42	Preparation,Preservation&Uses of Fresh frozen plasma		
15 th	43	Preparation,Preservation&Uses of Cryoprecipitate &PRP	L15	Preparation of platelet poor plasma
	44	Immediate Immune mediated Transfusion Reaction		
	45	Delayed Immune mediated Transfusion Reaction		
16 th	46	Revision	L16	Revision
	47	Revision		
	48	Revision		