

INTEGRAL UNIVERSITY, LUCKNOW INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

BACHELOR OF SCIENCE IN MEDICAL LABORATORY TECHNOLOGY (B.Sc. MLT)

SYLLABUS

YEAR/ SEMESTER: III/V



Integral University, Lucknow Department of Paramedical Sciences <u>Study and Evaluation Scheme</u>

Semester-V

S. N.	Course	Course Title	Type of Paper	Period Pe	er hr/w	/eek/sem	Evaluation Scheme				Sub.	Credit	Total
144	code	course ride	orruper	L	Т	Р	СТ	ТА	Total	ESE	Total	cicuit	Credits
			-	THEORIES	5								
1	LT301	General & Clinical Pathology	Core	3	1	0	40	20	60	40	100	3:1:0	4
2	LT302	Blood Banking & Genetics	Core	2	1	0	40	20	60	40	100	2:1:0	3
3	LT303	Analytical Biochemistry	Core	2	1	0	40	20	60	40	100	2:1:0	3
4	LT304	Basic Preventive Medicine & Community Health Care	Core	2	1	0	40	20	60	40	100	2:1:0	3
5	LT305	Medical Parasitology	Core	2	1	0	40	20	60	40	100	2:1:0	3
				PRACTICA	L								
1	LT306	Blood Banking & Genetics- Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
2	LT307	Analytical Biochemistry- Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3	LT308	Medical Parasitology - Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
4	LT309	Hospital Posting - Lab	Core	0	0	12	40	20	60	40	100	0:0:6	6
		Total		11	05	18	360	180	540	360	900	25	25

S.			Туре			At	tributes				United Nation Sustainable
з. N.	Course code	Course Title	of Paper	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	Development Goal (SDGs)
		THEORIES									
1	LT301	General & Clinical Pathology	Core	\checkmark	\checkmark	\checkmark			\checkmark		3,4
2	LT302	Blood Banking & Genetics	Core	\checkmark	\checkmark	\checkmark	\checkmark				3,4
3	LT303	Analytical Biochemistry	Core	\checkmark	\checkmark	\checkmark	\checkmark			\checkmark	3,4
4	LT304	Basic Preventive Medicine & Community Health Care	Core	\checkmark	\checkmark	\checkmark	\checkmark		\checkmark	\checkmark	3,4
5	LT305	Medical Parasitology	Core	\checkmark	\checkmark	\checkmark	\checkmark			\checkmark	3,4
		PRACTICAL									
1	LT306	Blood Banking & Genetics- Lab	Core	\checkmark	\checkmark	\checkmark	\checkmark			\checkmark	3,4
2	LT307	Analytical Biochemistry- Lab	Core	\checkmark	\checkmark	\checkmark	\checkmark			\checkmark	3,4
3	LT308	Medical Parasitology - Lab	Core	\checkmark	\checkmark						3,4
4	LT309	Hospital Posting - Lab	Core	\checkmark							3,4

 L: Lecture
 T: Tutorials
 P: Practical
 CT: Class Test
 TA: Teacher Assessment ESE: End Semester Examination,

 AE= Ability enhancement, DSE- Discipline Specific Elective, Sessional Total: Class Test + Teacher Assessment
 Ta: Teacher Assessment ESE: End Semester Examination,



Effective from Session: 2019	9-20											
Course Code	LT301	Title of the Course	GENERAL & CLINICAL PATHOLOGY	L	Т	Р	С					
Year	III	Semester	V	3	1	0	4					
Pre-Requisite	Nil	Nil Co-requisite Nil										
Course Objectives	The students will be made aware of the General Pathology. In addition, they will understand Mechanism of disease, its											
Course Objectives	Nature, processes, pathogenesis and accountability.											

	Course Outcomes								
CO1	Students are able to identify the different condition like cell injury, cell adaptations.								
CO2	Students are able to identify the different condition like cell injury, cell adaptations,								
CO3	Students are able to identify the different condition like cell adaptations, Inflammation, liver cirrhosis								
CO4	Students are able to identify the different condition like Hepato-Biliary Pathology.								
CO5	Students are able to identify the different condition like Fluid Analysis								

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO							
1	CELL INJURY	Cell injuries –Introduction and Types. Reversible cell injury: Types, Sequential changes. Irreversible cell injury: Types of Necrosis & Gangrene, Autolysis. Amyloidosis - Classification, Pathogenesis, Pathology including special stains.	8	CO1							
2	CELL ADAPTATIONS	Growth Disturbances and Neoplasia Atrophy, Hypertrophy, Hyperplasia, Aplasia, Hypoplasia, Metaplasia, Malformation, agenesis, dysplasia. Precancerous lesions. Neoplasia: Definition, classification, biological behaviour: Benign and Malignant, Carcinoma and Sarcoma. Malignant Teratoma.	8	CO2							
3	INFLAMMATION	Infections- Definition, Components, Types, Pathogenesis. Inflammation- Introduction, Definition, Sign, Types. Acute inflammation, Chronic inflammation, mechanism, sign, inflammatory cells, symptoms.	8	CO3							
4	HEPATO-BILIARY PATHOLOGY	Hepato – biliary pathology. Jaundice: Types, aetio-pathogenesis and diagnosis. Hepatitis: Acute, Chronic, neonatal. Alcoholic liver disease. Cirrhosis: Post necrotic, Alcoholic, Metabolic and Portal hypertension Liver abscesses; Pyogenic, parasitic and Amoebic. Tumours of Liver, Endocrine Pathology-Diabetes Mellitus: Types, Pathogenesis, Pathology, Laboratory diagnosis.	8	CO4							
5	FLUID ANALYSIS	Seminal fluid analysis: Normal semen, production, composition, specimen handling and disposal of sample, physical examination, chemical and microscopic examination, sperm concentration techniques. CSF and other body fluids: Normal composition, production, normal values, physiological alteration, sample collection, preservation, storage, handling, processing and disposal of CSF, Ascetics fluid, Plural fluid, pericardial fluid, Synovial fluid.	8	CO5							
Refere	nce Books:										
	tbook of Medical Laboratory Tec										
	dical Laboratory Technology by H	K L Mukherjee Volume-I.									
	ctical Hematology by J.B.Dacie.	/ Laboratory methods (20thedition) by John Bernard Henry									
	as of Hematology by G.A.McDon										
	0, 1										
e-Learning Source: 1. https://www.slideshare.net/appyakshay/cell-injury-75140470											
	1. <u>https://www.shdeshare.net/appyakshay/cell-injury-/5140470</u> 2. https://www.webmd.com/arthritis/about-inflammation										
	os://slideplayer.com/slide/709466										

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-	DO1	DOD	DO2	DO4	DOS	DOC	DO7	DOP	DOO	DO10	DO11	DO12		DEOD	DCO4	DEOS	DEOC	DE O7
PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	-	1
CO2	1	3	1	3	-	-	-	1	3	-	-	3	3	2	-	2	-	1
CO3	1	3	1	2	-	-	-	1	2	-	-	2	3	1	-	1	-	1
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	-	1
CO5	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	-	1

			Attribu	lies & SDGs					
Course Code	Course Title			Att	ributes				SDGs
LT301	GENERAL & CLINICAL	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.
	PATHOLOGY								3,4



Effective from Session	: 2019-20						
Course Code	LT302	Title of the Course	BLOOD BANKING & GENETICS	L	Т	Р	С
Year	III	Semester	V	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	of blood grouping,	compatibility testing in students learn about Fund	t blood grouping &blood, Transfusion. The students will blood transfusion &screening of donated blood for var lamentals of Heredity. The students will learn about the	ious I	nfectior	Disea	ases.

	Course Outcomes
CO1	Students are able to perform blood grouping, cross matching, compatibility test, blood collection, preservation, separation and storage.
CO2	Students are able to perform Blood Component, cross matching, compatibility test, blood collection, preservation, separation and storage.
CO3	Students are able to perform Transfusion reactions, compatibility test, blood collection, preservation, separation and storage.
CO4	Students are able to perform about the Genetics.
CO5	Students are able to perform blood genetic materials.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO							
1	BLOOD GROUP & CROSS MATCHING	 History and discovery of blood group system, ABO and Rhesus blood group system, Cell and serum grouping, various methods, interpretation of results. Discrepancies in blood grouping and resolving problems, Variants of D antigen and weak D typing. Compatibility testing: - definition, indication methods. Coombs test: - Direct, indirect, principle, procedure, interpretation, applications. 	6	CO1							
2	BLOOD COMPONENT	Blood component: Preparation, labeling, storage, cell separator, Preparation of packed cells and various fractions of blood for transfusion purposes .Total quality management, documentation record keeping.	6	CO2							
3	TRANSFUSION REACTION	REACTION Compatibility tests in blood transfusion, complications and hazard of blood transfusion. Transfusion transmissible diseases, screening methods (Sample collection, processing, handling and disposal).									
4	GENETICS	Genetics- Continuity of life-heredity, variation, Mendel's laws of inheritance, Chromosomal basis of inheritance; other patterns of inheritance- incomplete dominance, multi parallelism, quantitative inheritance.	6	CO4							
5	GENETIC MATERIAL	Chromosomes-Bacterial cell and eukaryotic cell; parallelism between genes and chromosomes; genome, linkage and crossing over; gene mapping; recombination. Molecular genetics: DNA as a genetic material- its structure and replication; structure of RNA and its role in protein synthesis, Vectors, plasmids, Human Genetics, Microbial genetics.	6	CO5							
	rence Books:										
	Practical Hematology by J										
	Transfusion Science by O										
		nology by K.L. Mukherjee Volume-I. sion in Clinical Medicine, 12th Edition by Harvey G. Klein.									
	Genes by Benjamin Lewir										
-	Genetics by B. D. Singh.	lı									
-	e-Learning Source:										
	1. <u>https://www.healthline.com/health/blood-typing-and-crossmatching</u>										
		et/peddanasunilkumar/blood-transfusion-reactions-119314356									
3.	https://study.com/acaden	ny/lesson/genetic-material-definition-structure-function.html									

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	-	1
CO2	1	3	1	3	-	-	-	1	3	-	-	3	3	2	-	2	-	1
CO3	1	3	1	2	-	-	-	1	2	-	-	2	3	1	-	1	-	1
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	-	1
CO5	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	-	1

			Attribut										
Course Code	Course Title		Attributes										
LT302	BLOOD BANKING & GENETICS	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.				
		1	1	1	1		1	4	3,4				



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Effective from Sessi	Effective from Session: 2019-20													
Course Code	LT303													
Year	II	Semester	Ш	2	1	0	3							
Pre-Requisite	Nil	Co-requisite	Nil											
Course Objectives	This course Biochemistry	course deals with fundamentals of metabolism, metabolic disorders, laboratory test and instruments of Clinical												

	Course Outcomes: After the successful course completion, learners will develop following attributes:
CO1	Students are able to perform all the test on spectrophotometer & colorimeter
CO2	Students are able to handle the photometer.
CO3	Students are able to known the technique of chromatography-qualitative & quantitative both.
CO4	Students are understand the principle & technique of different kind of electrophoresis.
CO5	Students are able to know about many types of enzymatic reaction.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	SPECTRO PHOTOMETRY AND COLORIMETRY	Spectro photometry and colorimetry Introduction, Theory of spectrophotometry and colorimetry, Lambert's law and Beer's law, Applications of colorimetry and spectrophotometry.	6	CO1
2	PHOTOMETRY	Photometry: Introduction, General principles of flame photometry, Limitations of flame photometry, Instrumentation, Applications of flame photometry, Atomic absorption spectroscopy – Principle & applications.	6	CO2
3	CHROMATOGRAPHY	Chromatography: Introduction, Types of Chromatography. Paper Chromatography: Introduction, principle, types, details for qualitative and quantitative analysis, application. Thin layer chromatography: Introduction, experimental techniques, application of TLC, limitations, High performance thin layer chromatography. Column chromatography: Introduction, principle column efficiency, application of column chromatography. Gas chromatography: Introduction principle, instrumentation, application. Ion exchange chromatography: Introduction, Definition and principle, cation and anion exchangers, application. Gel Chromatography: Introduction Principle and method, application and advantages.	6	CO3
4	ELECTROPHORESIS	Electrophoresis: Introduction, Principle, Instrumentation, Applications, Types of electrophoresis, Paper electrophoresis, Gel electrophoresis.	6	CO4
5	ENZYME PRINCIPLES	Enzymes Principles, Clinical significance and Procedures for estimation: Acid phosphatase, Alkaline phosphatase, Lactate dehydrogenase, Aspartate transaminase Alanine transaminase, Creatine phosphokinase.	6	CO5
	ence Books:			
	ctical Clinical Biochemistry by			
	dical Laboratory Technology b			
	t book of Medical Laboratory ncipal of Biochemistry by M. A			
	rumental Analysis by Chatwa			
	t book of Medical Biochemist			
	chemistry by Voet & Voet.			
8. Prir	ncipal of Biochemistry by Leh	ninger.		
	chemistry by Voet & Voet.			
	arning Source:			
		ent/uploads/2021/04/UV-VIS Part-1.pdf		
	s://en.wikipedia.org/wiki/Chro			
3. <u>http</u>	os://soe.unipune.ac.in/studyma	terial/ashwiniWadegaonkarSelf/BSC%20821%20Ch%205.pdf		

					Cour	se Arti	culatio	n Matı	rix: (M	apping o	of COs v	vith POs	s and PS	Os)			
PO-PSO	PO1	PO2	PO3	PO4	PO5	DOG	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
СО	FOI	FO2	FUS	F04	FUS	FOO	F07	FUo	F09	FOID	FUIT	FO12	1301	F302	1303	F304	1303
CO1	1	3	2	2	_	-	-	1	2	1	-	2	2	1	-	1	_
CO2	1	3	1	3	-	-	-	2	3	-	-	3	3	2	-	2	-
CO3	1	3	1	2	-	-	-	1	2	2	-	2	3	1	-	1	-
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	-
CO5	1	3	1	2	-	-	-	1	2	1	-	2	2	1	-	1	-

			Attibu										
Course Code	Course Title		Attributes										
LT303	CLINICAL	Employability	Entrepreneursh ip	Skill Developme nt	Gender Equalit y	Environment & Sustainability	Huma n Value	Professional Ethics	No.				
	BIOCHEMISTRY	√	\checkmark	\checkmark	\checkmark		\checkmark	\checkmark	3,4				



Effective from Session	n: 2019-20											
Course Code	LT304	Title of the Course	BASIC PREVENTIVE MEDICINE AND COMMUNITY HEALTH CARE	L	L T 2 1		С					
Year	III											
Pre-Requisite	Nil Co-requisite Nil											
Course Objectives	This curriculum im	part the knowledge of vari	ous types of diseases and functioning of various programs	5.								
Course Outcomes												
							-					

CO1	Students are study about important health acts & health related programme, and also about the different concepts of epidemiology.
CO2	Students know about communicable disease like- malaria, TB, hepatitis, dengue, etc.
CO3	Students are able to know about many different national disease control programs like, DOTS, NACP, UIP, etc.
CO4	Students are study about problems related to population, growth rate, death rate, etc.
CO5	Students are able to known about various national immunization programs and organizations like- WHO, UNICEF, UNFPA, FAO, etc.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	HEALTH	Definition and concepts of health, important public health acts, health problems of developed and developing countries, environment and health. Definition and concepts of epidemiology, diseases, types and use of epidemiology. Basic emergency care and first aid.	6	CO1
2	COMMUNICABLE DISEASE	Epidemiology, etiology, pathogenesis and control of communicable disease like malaria, cholera, tuberculosis, leprosy, diarrhea, poliomyelitis, viral hepatitis, measles, dengue, rabies, AIDS.	6	CO2
3	NATIONAL PROGRAMS	National Health Policy and Programs, DOTS, National AIDS control programs, National cancer control programs, universal immunization programs etc. Nutrition and major nutritional problems etiology, manifestations and prevention, components of RCH care. Examination of water, food adulteration, role of regular exercise and yoga in prevention and management of various diseases	0	CO3
4	POPULATION	Population, problems of population growth, birth rates, death rates, fertility rates, MMR., CPR, Approaches and methods of contraception, Reproductive and child health. Hygiene and sanitation, sanitation barriers, excreta disposal.	6	CO4
5	IMMUNIZATION	Immunization programs, various national immunization programs and vaccine schedules, Family welfare and planning, communicable and non-communicable disease, Health planning in India including various committees, national health policy and health goals. Objectives and goals of WHO, UNICEF, Indian Red Cross Society, UNFPA, FAO, ILO.	б	CO5
Refere	nce Books:			

1. Harsh Mohan (2017), Textbook of Pathology,7th edition, Jaypee Publications.

2. K. Parks& Sunder Lal, (2015), Textbook of Preventive Social Medicine ,3rd edition, Bhanot Publications.

e-Learning Source:

1. https://acphd.org/communicable-disease/

2. https://main.mohfw.gov.in/sites/default/files/Chapter615.pdf

3. https://www.nhp.gov.in/universal-immunisation-programme_pg

						Co	ourse A	rticula	tion Ma	trix: (N	lapping	of COs v	with POs	and PSO	Os)			
P	O-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
	CO	FUI	FO2	FUS	F04	FUS	FUU	FO/	FUo	F09	FOID	FOIT	F012	1301	F302	1303	1304	1303
	CO1	1	3	2	2	-	-	-	1	2	-	-	2	3	1	2	3	-
	CO2	1	3	1	3	-	-	-	2	3	-	-	3	3	-	1	2	-
	CO3	1	3	1	2	-	-	-	1	2	-	-	2	2	2	1	2	2
	CO4	1	3	1	2	-	-	-	1	3	1	-	3	2	3	1	3	2
	CO5	1	3	1	2	-	-	-	1	2	2	-	2	3	1	2	2	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code	Course Title		Attributes								
	BASIC PREVENTIVE	Employability	Entropyon overship	Skill	Gender	Environment &	Human	Professional	No.		
1 320.4	MEDICINE AND	Employability	Entrepreneurship	Development	Equality	Sustainability	Value	Ethics			
LT304	COMMUNITY HEALTH CARE	1	1	4	4		4	4	3,4		



Effective from Session	n: 2019-20						
Course Code	LT305	Title of the Course	MEDICAL PARASITOLOGY	L	Т	Р	С
Year	III	Semester	V	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The student will be important parasites.	0	, general characteristics, life cycle and laboratory diagno	sis of	various	s medic	ally

	Course Outcomes
CO1	Students are able known about characteristics, habitat, morphology & life cycle of different types of parasites.
CO2	Students are able to known about characteristics, habitat, morphology & life cycle of different types of Helminthes.
CO3	Students are study about stool examinations like- collection, preservation, physical chemical & microscopic examination.
CO4	Students are able to make a thin or thick smear for parasitic examination and also about various types of stains.
CO5	Students are able known about collection, handling, transport and preservation of samples for parasitological investigations.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	PARASITOLOGY	Introduction to Medical Parasitology with respect to terms used in Parasitology. Protozoology/ Protozoal parasites: General characteristics of protozoa, Geographical distribution, Habitat, Morphology, lifecycle, Mode of infection and laboratory diagnosis of Entamoeba sp. Geographical distribution, Habitat, Morphology, life cycle, Mode of infection and laboratory diagnosis of Intestinal and vaginal flagellates i.e., Giardia, Trichomonas sp. Geographical distribution, Habitat, Morphology, life cycle, Mode of infection and laboratory diagnosis of blood and tissue flagellates i.e., Plasmodium and Toxoplasma sp.	6	COI
2	HELMINTHOLOGI CAL	Helminthology/ Helminthic parasites: General characteristics of Cestodes, Trematodes and Nematodes. Geographical distribution, Habitat, Morphology, life cycle, Mode of infection and laboratory diagnosis of -Taeniasolium and saginata, Echinococcusgranulos, Hymenolepis nana, Schistosoma haematobium and mansoni, Fasciola hepaticabuski, Trichuristrichura, Trichinellaspirales,Strongyloidesstercoralis,Ancylostomaduodenale Enterobiusvermicularis Ascaris lumbricoides, Wuchereriabancrofti, Dracunculusmedinensis	6	CO2
3	DIAGNOSTIC PROCEDURE	Diagnostic procedures: Collection of stool samples, Preparation of material for unstained and stained preparations Staining methods i.e., Iodine staining and permanent staining. General rules for microscopic examination of stool samples, Examination of Stool for parasites for intestinal protozoal infections, For Helminthic infections.	6	CO3
4	SLIDE PREPARATION	Introduction, direct smear preparation and examination, Concentration techniques i.e., Flotation and sedimentation techniques, Egg counting techniques. Examination of blood for parasites, Preparation of thin and thick blood film, Leishman staining Examination of thick and thin smear, Field 's stain, JSB stain.	6	CO4
5	SAMPLES	Collection, Transport, processing and preservation of samples for routine parasitological investigations. Laboratory diagnosis of hydated cyst and cysticercosis. Concentration techniques for demonstration of Ova and Cysts (Principles and applications).	6	CO5
	nce Books:			
		nical Medicine by K D Chatterjee.		
		Hati, Pub. Allied Book Agency.		
	dical Parasitology by D.R. nical Parasitology by Paul			
	arning Source:			
	arning Source: .ps://www.ncbi.nlm.nih.go	v/books/NBK8262/		
	s://en.wikipedia.org/wiki/			
	·	n/doi/abs/10.1128/9781555817381.ch133		

Г			Co	urse A	rticulat	ion Ma	triv (N	lapping	of COs y	with
L				uise A	i ticula	1011 1016	111 IA. (IV.	Tapping	01 003	/////

		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO	PO1	PO2	PO3		PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO	101	102	105	104	105	100	10/	100	109	1010	1011	1012	1301	1302	1305	1304	1305
CO1	1	3	2	2	-	-	-	1	2	-	-	2	3	1	2	3	-
CO2	1	3	1	3	-	-	-	2	3	-	-	3	3	-	1	2	-
CO3	1	3	1	2	-	-	-	1	2	-	-	2	2	2	1	2	2
CO4	1	3	1	2	-	-	-	1	3	1	-	3	2	3	1	3	2
CO5	1	3	1	2	-	-	-	1	2	2	-	2	3	1	2	2	2

Course Code	Course Title		Attributes							
LT305	MEDICAL	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Professional Value Ethics	Professional Ethics	No.	
	PARASITOLOGY	√	4	√	1		1	4	3,4	



Effective from Sessi	on: 2019-20									
Course Code	LT306	Title of the Course	CourseBLOOD BANKING & GENETICS- LABLTP							
Year	III	Semester	er V 0 0							
Pre-Requisite	Nil	Co-requisite	Nil							
Course Objectives	The student will be taught about introduction of Abo-Rh grouping Blood donor screening, component preparation, screening of blood. according to NACO & SBTC guidelines.									
	0 0 1	1.0 .1 .0.1					1			

	Course Outcomes: After the successful course completion, learners will develop following attributes:
CO1	Students are study about Screening of Blood donor
CO2	Students are study about ABO & Rh grouping
CO3	Students are study about Collection and preservation of blood for transfusion purpose
CO4	Students are study about Screening of Transfusion transmitted diseases
CO5	Students are study about Blood component preparation storage system.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO						
1	Donor Screening	1. Screening of blood donor: physical examination including medical history of the donor.		CO1						
2	Blood Collection	2. Collection and preservation of blood for transfusion purpose.		CO1						
3	Blood Screening	3. Screening of blood for Malaria, Microfilaria, HBs Ag, Syphilis and HIV.		CO2						
4	ABO-Rh Grouping	4. To determine the ABO & Rh Grouping-Direct or preliminary grouping, Indirect or proof grouping.	30	CO3						
5	Du-testing	5. Rh grouping and determination of Du in case of Rh negative.		CO3						
6	DAT/IAT	6. To perform Direct and Indirect Coomb 's test.		CO4						
7	Compatibility Testing	7. To perform cross matching - Major cross matching, Minor cross matching.		CO4						
8	Component Preparation	8. Preparation of various fractions of blood.		CO5						
Refere	nce Books:									
1. Pra	actical Hematology by	J.B. Dacie								
2. Mo	ollison's Blood Transfu	sion in Clinical Medicine								
3. Me	edical Laboratory Tech	nology by K.L. Mukherjee Volume-								
4. Tra										
e-Lea	arning Source:									
1.	https://www.healthline.c	om/health/blood-typing-and-crossmatching								
2. htt	tps://www.slideshare.net/pe	ddanasunilkumar/blood-transfusion-reactions-119314356								

3. https://study.com/academy/lesson/genetic-material-definition-structure-function.html

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	2	2	-	-	-	1	2	1	-	2	2	1	-	1	-
CO2	1	3	1	3	-	-	-	2	3	-	-	3	3	2	-	2	-
CO3	1	3	1	2	-	-	-	1	2	2	-	2	3	1	-	1	-
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	-
CO5	1	3	1	2	-	-	-	1	2	1	-	2	2	1	-	1	-

Course Code	Course Title		Attributes							
			Entrepreneursh	Skill	Gender	Environment	Huma	Professional	No.	
1 77206	BLOOD BANKING &	Employability	in	Developme	Equalit	&	n	Ethics		
LT306	GENETICS- LAB		ıp	nt	у	Sustainability	Value	Ethics		
		1	\checkmark	√	\checkmark		\checkmark	√	3,4	



Effective from Session: 2	2019-20										
Course Code	LT307	Title of the Course	ANALYTICAL CLINICAL BIOCHEMISTRY- LAB	L	Т	Р	С				
Year	III	Semester	V	0	0	2	1				
Pre-Requisite	Nil	Co-requisite	Nil								
Course Objectives	The student w	tudent will be taught about demonstration & working of different types of biochemistry lab Equipment.									

		Course Outcomes						
CO1	Students are study about	principle, working & maintenance of colorimeter.						
CO2	2 Students are study about principle, working & maintenance of flame photometer.							
CO3	CO3 Students are study about e principle, procedure of paper chromatography.							
CO4	Students are study about	principle & demonstration of TLC.						
CO5	Students are study about	principle & procedure of Electrophoresis.						
Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO				
1	Spectrophotometer	1 To demonstrate the principle, working & maintenance of spectrophotometer		CO1				

No.			Hrs.	CO						
1	Spectrophotometer	1. To demonstrate the principle, working & maintenance of spectrophotometer.		CO1						
2	Colorimeter	2. To demonstrate the principle, working & maintenance of colorimeter.		CO1						
3	Flame photometer	3. To demonstrate the principle, working & maintenance of flame photometer.		CO2						
4	Paper chromatography	4. To demonstrate the principle, procedure of paper chromatography.	30	CO3						
5	5 Gas chromatography 5. To demonstrate the principle & procedure of gas chromatography CO3									
6	6 TLC 6. To demonstrate the principle & demonstration of TLC. CO4									
7	7 Column chromatography 7. To demonstrate the principle & procedure of column chromatography. CO5									
8										
Refere	nce Books:									
1. Pra	ctical Clinical Biochemistry by H	Iarold Varle.								
2. Tex	t book of Medical Laboratory Te	echnology by P. B. Godker								
3. Me	dical Laboratory Technology by	Mukherjee.								
4. Prir	ncipal of Biochemistry by M. A.	Siddiqi.								
5. Inst	rumental Analysis by Chatwal A	nand.								
6. Tex	t book of Medical Biochemistry	by Chatterjee, Shinde.								
7. Prir	ncipal of Biochemistry by Lehnin	nger.								
	chemistry by Voet & Voet.	v								
e-Learning Source:										
1. <u>https://www.spcmc.ac.in/wp-content/uploads/2021/04/UV-VIS_Part-1.pdf</u>										
2. https://en.wikipedia.org/wiki/Chromatography										
3. http	s://soe.unipune.ac.in/studymater	ial/ashwiniWadegaonkarSelf/BSC%20821%20Ch%205.pdf								

						Course	Articu	lation I	Matrix: (Mapping	g of COs	with POs	and PSO	s)			
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
СО	101	102	105	104	105	100	107	108	109	1010	1011	1012	1301	1502	1505	1504	1305
CO1	1	3	1	2	-	-	-	1	2	1	-	2	-	1	2	-	3
CO2	2	3	2	2	-	-	-	1	3	1	-	3	-	2	1	-	2
CO3	1	3	1	2	-	-	-	1	2	-	-	2	-	1	2	-	3
CO4	2	3	1	2	-	-	-	1	3	-	-	3	-	2	3	-	3
CO5	1	3	1	2	-	-	-	1	2	1	-	2	-	1	2	-	3
				1 L or	r Corr	lation	2 Mo	darata	Corrola	tion 2	Substant	ial Corr	lation				

			Attribu	tes & SDGs					
Course Code	Course Title			Att	ributes				SDGs
LT307	ANALYTICAL CLINICAL	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.
L1307	BIOCHEMISTRY- LAB	1	1	V	4		4	V	3,4



Effective from Session:	2019-20						
Course Code	LT308	Title of the Course	MEDICAL PARASITOLOGY - LAB	L	Т	Р	С
Year	III	Semester	V	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The student w	ill be taught about laborat	tory diagnosis of various medically important parasites & mic	roscor	V.		

	Course Outcomes
CO1	Students are study about medical Parasitology with respect to terms used in Parasitology.
CO2	Students are study about General character, mode of infection lab diagnosis of many parasites.
CO3	Students are study about sample collection & identification of different parasites.
CO4	Students are study about slide preparation & staining of different parasitic infection.
CO5	Students are study about Collection, Transport, processing and preservation of samples for routine parasitological investigations.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO					
1		1. Routine stool examination for detection of intestinal parasites with concentration methods.		CO1					
2	Parasitology Helminthological	2. Saline preparation, Iodine preparation, Floatation method Centrifugation method, Formal ether method, Zinc sulphate method.		CO2					
3									
4	Slide preparation 4. Tapeworm, Tapeworm segments, Ascaris (Round worm), Hookworms, Pinworms.								
5	Samples	 4. Tapeworm, Tapeworm segments, Ascaris (Round worm), Hookworms, Pinworms. 5. Malarial parasite. 							
6		6. Preparation of thin and thick smears, Staining of smear, Examination of smears for malarial parasites (P. vivax and P. falciparum).	1	CO5					
Refere	nce Books:								
1. Para	asitology in relation to Clinical M	Medicine by K D Chatterjee.							
2. Mee	dical Entomology by A.K. Hati,	Pub. Allied Book Agency.							
3. Mee	dical Parasitology by D.R. Arora	L.							
4. Clir	nical Parasitology by Paul Chesto	er Beaver.							
e-Lea	rning Source:								
1	https://www.ncbi.nlm.nih.gov	//hooks/NBK8262/							

1. <u>https://www.ncbi.nlm.nih.gov/books/NBK826</u>

2. <u>https://en.wikipedia.org/wiki/Helminthology</u>
3. <u>https://onlinelibrary.wiley.com/doi/abs/10.1128/9781555817381.ch133</u>

						Course	e Articu	lation I	Matrix: (Course Articulation Matrix: (Mapping of COs with POs and PSOs)													
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5						
C01	1	3	1	2	-	-	-	1	2	1	-	2	-	1	2	-	3						
CO2	2	3	2	2	-	-	-	1	3	1	-	3	-	2	1	-	2						
CO3	1	3	1	2	-	-	-	1	2	-	-	2	-	1	2	-	3						
CO4	2	3	1	2	-	-	-	1	3	-	-	3	-	2	3	-	3						
CO5	1	3	1	2	-	-	-	1	2	1	-	2	-	1	2	-	3						

			Attribu	les a sugs					
Course Code	Course Title			Att	ributes				SDGs
LT308	MEDICAL PARASITOLOGY - LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.
21500	I AKASII OLUUT - LAD	1	1	1	1		1	4	3,4



Effective from Sessio	n: 2019-20						
Course Code	LT309	Title of the Course	HOSPITAL POSTING- LAB	L	Т	Р	С
Year	III	Semester	V	0	0	12	06
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The student will be ta	aught about different typ	be of medical laboratory work according to respective SOPS				

	Course Outcomes
CO1	The students will study about clinical sample collection.
CO2	The students will study about Sample accountability
CO3	The students will study about Quality Management system
CO4	The students will study about Biomedical waste management
CO5	The students will study about Calibration and Validation of Clinical Laboratory instruments.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1		1. Determination of hemoglobin by various methods.		CO1
2		2. Determination of Total RBC count.		CO1
3		3. Determination of PCV.		CO1
4		4. Determination of red cell indices.		CO2
5		5. Demonstration of hypochromic microcytic slide.		CO2
6		6. General blood picture.		CO2
7		7. Determination of G-6-PD.		CO3
8	Hospital Posting	8. Differential Leucocyte Count.	150	CO3
9		9. Absolute leucocyte count.		CO3
10		10. Demonstration of toxic granulation of neutrophil.		CO4
11		11. To perform PT and Calculate INR.		CO4
12		12. Toperform APTT.	-	CO4
13		13. Toperform sickling test.]	CO5
14		14. Determination of Plasma Hemoglobin.		CO5
15		15. Toperform reticulocyte count.]	CO5
	·	· · · · · · · · · · · · · · · · · · ·	•	

Reference Books:

1. Textbook of Medical Laboratory Technology by Praful B.Godkar.

2. Medical Laboratory Technology by K L Mukherjee Volume-I.

3. Practical Hematology by J.B.Dacie.

4. Clinical Diagnosis & Management by Laboratory methods (20thedition) by John Bernard Henry

e-Learning Source:

1. https://docs.google.com/presentation/d/1wFllcX0tvZ_BUAB1nDhstmj9KLU0-

3Fb/edit?usp=share_link&ouid=106521868798423984598&rtpof=true&sd=true

2. <u>https://en.wikipedia.org/wiki/Complete_blood_count</u>

3. https://www.hopkinsmedicine.org/health/conditions-and-diseases/g6pd-glucose6phosphate-dehydrogenase-

deficiency#:~:text=G6PD%20deficiency%20is%20an%20inherited,enzyme%20can%20cause%20hemolytic%20anemia.

					Co	ourse A	rticulat	tion Ma	atrix: (N	Iapping	of COs	with POs	and PSC	Os)			
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-
CO2	1	3	1	3	-	-	-	1	3	-	-	3	-	2	-	2	-
CO3	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-
CO4	1	3	1	2	-	-	-	1	3	-	-	3	-	1	-	1	-
CO5	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

Course Code	Course Title			Att	ributes				SDGs
LT206	HOSPITAL POSTING-	Employability	Entrepreneurship	Skill Development	Gender Equality	Gender Environment & Human			No.
	LAB	√	*	4	1		1	4	3,4



INTEGRAL UNIVERSITY, LUCKNOW INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

BACHELOR OF SCIENCE IN MEDICAL LABORATORY TECHNOLOGY (B.Sc. MLT)

SYLLABUS

YEAR/ SEMESTER: III/VI



Integral University, Lucknow Department of Paramedical Sciences Study and Evaluation Scheme

Semester-VI

Program: B.Sc. MLT

Period Per Туре **Evaluation Scheme** S. Course Total hr/week/sem Sub. Total of Paper N. **Course Title** Credit code Credits Т Р СТ Total ESE TA THEORIES Cytopathology & Cytotechniques 31:0 LT310 Core LT311 Clinical Endocrinology & Toxicology Core 3:1:0 Clinical Virology LT312 3:1:0 Core Medical Mycology 2:1:0 LT313 Core Research Methodology & Biostatistics LT314 Core 2:1:0 PRACTICAL Cytopathology & Cytotechniques-Lab LT315 Core 0:0:1 LT316 Clinical Endocrinology & Toxicology - Lab 0:0:1 Core Clinical Virology & Medical Mycology -Lab LT317 0:0:1 Core Hospital Posting - Lab LT318 Core 0:0:6 Total

S.	Course		Туре			United Nation Sustainable					
N.	Course code	Course Title	of Paper	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
THE	ORIES										
1	LT310	Cytopathology & Cytotechniques	Core	\checkmark	\checkmark	\checkmark	\checkmark				3,4
2	LT311 Clinical Endocrinology & Toxicology		Core	\checkmark	\checkmark	\checkmark	\checkmark				3,4
3	LT312	Clinical Virology	Core	\checkmark	\checkmark	\checkmark	\checkmark				3,4
4	LT313	Medical Mycology	Core	\checkmark	\checkmark	\checkmark	\checkmark				3,4
5	LT314	Research Methodology & Biostatistics	Core	\checkmark					\checkmark		3,4, 11
PRAC	ΓICAL										
1	LT315	Cytopathology & Cytotechniques-Lab	Core	\checkmark	\checkmark	\checkmark	\checkmark				3,4
2	LT316	Clinical Endocrinology & Toxicology - Lab	Core	\checkmark	\checkmark	\checkmark					3,4
3	LT317	Clinical Virology & Medical Mycology -Lab	Core	\checkmark	\checkmark	\checkmark	\checkmark				3,4
4	4 LT318 Hospital Posting - Lab Core		Core								

L: Lecture T: Tutorials P: Practical CT: Class Test TA: Teacher Assessment ESE: End Semester Examination, AE= Ability enhancement, DSE- Discipline Specific Elective, Sessional Total: Class Test + Teacher Assessment Subject Total: Sessional Total + End Semester Examination (ESE)



Effective from Session: 2	019-20											
Course Code	LT310	Title of the Course	CYTOPATHOLOGY & CYTOTECHNIQUES L T I									
Year	III Semester VI 3 1											
Pre-Requisite	Nil	Co-requisite	requisite Nil									
Course Objectives			ng procedures for demonstration of different substances & vaning procedures & handling & testing of various cytological			țical						

	Course Outcomes
CO1	The students will learn about various cytological staining procedures
CO2	The students will learn about various cytological investigations.
CO3	The students will learn about special staining procedures about cytology
CO4	The students will learn about Assessment of smearing and staining quality
CO5	The students will learn about identification of, normal, neoplastic and inflammatory cells.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Aspiration & Exfoliative Cytology	Introduction, Definition, Branches of Cytopathology. Aspiration cytology - Principles, indications and utility of the technique with special emphasis on role of cytotechnician in FNAC clinics, Equipments used in FNAC clinics. Exfoliative Cytology - Principles, indications and utility of the technique, Sample collection, labelling, preparation, processing of cervical, endometrial, respiratory tract, gastro intestinal tract and urinary tract sample, Smear preparation.	8	CO1
2	Fixatives and fixations	Fixatives and fixations: - types, uses, merits, demerits. Cell Block preparation. Routine staining with MGG: - Stains preparation, staining method, Mounting, Pap staining	8	CO2
3	Cryostat sectioning	Cryostat sectioning, its applications in diagnostic cytopathology. Enzyme Cytochemistry: Diagnostic applications Demonstration of Phosphatases, Dehydrogenases, Oxidases & Peroxidases, Vital staining for Sex Chromatin.	8	CO3
4	Cervical Cytology	Cervical Cytology: - Identification of normal cells, malignant cells, inflammatory cells. Assessment of staining quality, problems and remedies.	8	CO4
5	Fluid Cytology	 Fluid Cytology: - Assessment of smearing and staining quality, remedies, identification of, normal, neoplastic and inflammatory cells. Special stains used in cytology: - PAS, Alcian Blue, Mucicarmin, Giemsa, Sudan. 	8	CO5

Reference Books:

1. Medical Lab technology by Lynch.

2. An Introduction to Medical Lab Technology by F J Baker and Silverton

3. Bancroft's Theory and Practice of Histopathological Techniques by John D Bancroft.

4. Diagnostic Cytology by Koss Volume -II.

5. Handbook of Histopathological Techniques by C F A Culling.

e-Learning Source:

1 <u>https://www.sciencedirect.com/topics/medicine-and-dentistry/cytopathology</u>

2 https://www.thieme-connect.com/products/ejournals/pdf/10.1055/s-0039-1693098.pdf

3 https://www.slideserve.com/tevy/cytology-of-body-fluid

						Cou	ırse Art	iculatio	n Matrix	: (Mappir	ng of COs	with POs	and PSOs)				
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	1	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO2	1	3	2	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO3	1	3	1	2	-	-	-	1	1	1	-	3	2	1	1	1	1
CO4	2	3	1	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO5	1	3	1	2	-	-	-	1	1	1	-	3	2	1	1	1	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course	Code	Course Title		Attributes									
		CYTOPATHOLOGY &	Employability	Entrepreneurship	Skill	Gender	Environment &	Human	Professional	No.			
LT3			Employability	Entrepreneursnip	Development	Equality	Sustainability	Value	Ethics				
		CYTOTECHNIQUES	4	4	4	1		1	1	3,4			



Effective from Sessio	n: 2019-20									
Course Code	LT311	Title of the Course	CLINICAL ENDOCRINOLOGY & TOXICOLOGY	L	Т	Р	С			
Year	III	Semester	VI	2	1	0	3			
Pre-Requisite	Nil	Co-requisite	Nil							
Course Objectives	The students will	learn about various H	Hormones male & Females Classification, Mechanism	n of a	action,	Secret	tion			
and reference ranges.										

	Course Outcomes
CO1	The student will study about hormones classification & mechanism.
CO2	The student will study about determination & disordered of T3, T4, TSH
CO3	The student will study about Infertility profile: LH, FSH, TSH
CO4	The student will study about estimation and clinical significance, reference range, hypo and hyper secretion. Of various
	hormones
COF	

CO5 The student will study about Toxicology,

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Hormones, its classification & action	Hormones, Classification of hormones, organs of endocrine system their secretion and function, regulation of hormone secretion, Mechanism of action.	6	CO1
2	Thyroid function test	Thyroid function test: Thyroid hormones, biological function, hypothyroidism, hyperthyroidism, Determination of T3, T4, TSH, FT3, FT4, TBG, Disorder associated with thyroid dysfunction.	6	CO2
3	Infertility profile	Infertility profile: LH, FSH, TSH, Estrogen, Progesterone, Total Testosterone, Free testosterone, DHEA-S, 17- Ketosteroids, Prolactin, their estimation and clinical significance, reference range, hypo and hyper secretion, Triple Test.	6	CO3
4	Growth hormone	Growth hormone, ACTH, Aldosterone, Cortisol their estimation and clinical significance, reference range, hypo and hyper secretion.	6	CO4
5	Introduction of Toxicology	Introduction of Toxicology, Alcohol poisoning, Lead poisoning, Zinc poisoning, Mercury poisoning drugs abuse, screening procedure for drug screening, Spot tests, hair and urine test, Immunoassay for drugs.	6	CO5
	ence Books:			
		clinical chemistry,6 th edition Elsevier Publications.		
2. Bi	son (2013), Clinical chemi	istry, 7 th edition, wiley Publication.		
3. He	enry's clinical diagnosis ar	nd management by laboratory methods (2011), 22 nd edition, Elsevier.		
4. D	M Vasudevan (2011), text b	book of medical biochemistry, 8 th edition Jaypee Brothers.		
5. M	N Chatterjee & Rana Shind	le (2012), textbook of medical biochemistry, 8th edition Jaypee Publications.		

6. Singh & Sahni (2008), Introductory Practical Biochemistry, 2nd edition, alpha Science.

e-Learning Source:

1. https://byjus.com/biology/hormones/

2. https://docs.google.com/presentation/d/11DhZilsAs_n_hte5NqSQ30TV1RnMQOk5/edit?usp=share_link&ouid =116700992000575491834&rtpof=true&sd=true

3. https://www.slideshare.net/TSOLEMAN/1-introduction-15583147

		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO	101	102	105	104	105	100	107	100	107	1010	1011	1012	1501	1502	1505	1504	1505
CO1	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	1
CO2	1	3	1	3	-	-	-	1	3	-	-	3	3	2	-	1	1
CO3	1	3	1	2	-	-	-	1	2	-	-	2	3	1	-	1	1
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	1
CO5	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code	Course Title		Attributes								
LT311	CLINICAL ENDOCRINOLOGY & TOXICOLOGY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.		
21311		4	4	1	. √		4	1	3,4		



Effective from Sessio	on: 2019-20						
Course Code	LT312	Title of the Course	CLINICAL VIROLOGY	L	Т	Р	С
Year	III	Semester	VI	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The student will be	taught about introduction	on, general characteristics, life cycle and laboratory diagnos	sis of	various	Medic	ally
Course Objectives	important Viruses.						

	Course Outcomes							
CO1	The student will be taught about introduction to medically importance various viruses							
CO2	The student will be taught about Collection, transportation and storage of sample for viral diagnosis							
CO3	The student will be taught about Modes of viral transmission.							
CO4	The student will be taught about Symptoms, prophylaxis and control of various medically importance viruses							
CO5	The student will be taught about oncogenic viruses' prevention & control of medically importance viral diseases,							

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO				
1	Introduction to medical virology	 Introduction to medical virology. Introduction to medically important viruses. Structure and Classification of viruses. Multiplication of viruses. 	6	CO1				
2	viral diagnosis	 Collection, transportation and storage of sample for viral diagnosis. Staining techniques used in Virology Processing of samples for viral culture (Egg inoculation and tissue culture). 	6	CO2				
3	Modes of viral transmission	Modes of viral transmission: Persistent, non-persistent, vertical and horizontal Viral multiplication and replication strategies: Interaction of viruses with cellular receptors and entry of viruses. Assembly, maturation and release of virions.	6	CO3				
4	Viruses- prophylaxis and control	Poxviruses, Herpesviruses, hepaptitis viruses, retroviruses-HIV, Picorna viruses, rhabdoviruses, orthomyxoviruses and paramyxo viruses, TORCH profile, Symptoms, mode of transmission, prophylaxis and control of Polio, Herpes, Hepatitis, Rabies, Dengue, HIV, Influenza with brief description of swine flu, Ebola, Chikungunya, Japanese Encephalitis.	6	CO4				
5	Introduction to oncogenic viruses	Introduction to oncogenic viruses, Types of oncogenic DNA and RNA viruses, concepts of oncogenes and proto-oncogenes, prevention & control of viral diseases, antiviral compounds and their mode of action, interferon and their mode of action, General principles of viral vaccination.	6	CO5				
Referen	nce Books:							
		ual for tropical countries Vol. II Microbiology by Monica Chees brough						
		nology Vol. I, II, III by Mukherjee						
		y Panikar& Satish Gupte						
 Text book of Microbiology by Ananthanarayanan Practical Medical Microbiology by Mackie & MacCartney Volume 1 and 2 								
e-Learning Source:								
1.		nlm.nih.gov/books/NBK8098/						
2.		e.com/articles/s41579-021-00535-6						

. <u>https://www.nature.com/articles/s41579-021-00535-6</u>

https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/oncogenic-viruses

		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO	101	102	105	104	105	100	107	100	10)	1010	1011	1012	1501	1502	1505	1504	1505
CO1	2	3	-	2	1	-	-	-	1	1	-	1	2	1	3	2	1
CO2	1	3	-	2	-	-	-	-	1	-	-	1	2	1	3	2	1
CO3	2	3	-	2	-	-	-	-	1	1	-	1	2	1	3	2	1
CO4	1	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1
CO5	2	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

ſ	Course Code	Course Title		Attributes									
	LT312	CLINICAL VIROLOGY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.			
			4	4	4	4		1	7	3,4			



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Effective from Sessio	n: 2019-20						
Course Code	LT313	Title of the Course	MEDICAL MYCOLOGY	L	Т	Р	С
Year	III	Semester	VI	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The student will be	taught about introduction	on, general characteristics, life cycle and laboratory diagno	sis of	various	medic	ally
Course Objectives	important Fungi.						

	Course Outcomes							
CO1	The student will be taught about Basic concepts about superficial and deep Mycoses							
CO2	The student will be taught about Morphological, cultural characteristics of common fungal disease.							
CO3	The student will be taught about Morphology, Diseases & lab diagnosis of various medically importance fungi.							
CO4	The student will be taught about Processing of clinical samples for diagnosis of fungal infections							
CO5	The student will be taught about Preservation of fungal cultures, Routine myco-serological tests and skin tests.							

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO						
1	Introduction to Medical Mycology	Introduction to Medical Mycology Basic concepts about superficial and deep Mycoses Taxonomy and classification and general characteristics of various medically important fungi Normal fungal flora.	6	CO1						
2	Morphology of Fungi	Morphological, cultural characteristics of common fungal laboratory contaminants Culture media used in mycology. Techniques used for isolation and identification of medically important fungi.	6	CO2						
3	Fungi-Diseases & lab diagnosis of	Morphology, Diseases & lab diagnosis of: Candida, Dermatophytes, Mycetoma (Eumycetoma & Actionomycetoma), Cryptococcus, Histoplasmosis, Opportunistic Fungi, Blastomyces, coccidioidosis, Nocardia.	6	CO3						
4	Microscopy in Medical mycology laboratory	Direct microscopy in medical mycology laboratory, Processing of clinical samples for diagnosis of fungal infections i.e., Skin, nail, hair, pus, sputum, CSF and other body fluids.	6	CO4						
5	Methods for identification of fungi	Methods for identification of yeasts and moulds, Dimorphism in fungi, Antifungal susceptibility tests. Preservation of fungal cultures, Routine myco-serological tests and skin tests.	6	CO5						
Referen	nce Books:									
	t book of Microbiology by Ar									
	lical Microbiology by Panika									
	3. Medical laboratory Technology Vol. I, II, III by Mukherjee.									
4. Medical Laboratory manual for tropical countries Vol. II Microbiology by Monica Cheesbrough										
5. Practical Medical Microbiology by Mackie & MacCartney Volume 1 and 2.										
e-Learning Source:										
1. http	ps://www.uoanbar.edu.iq/eSto	preImages/Bank/7748.pdf								

2. <u>https://www.appsnet.org/Publications/Brown_Ogle/28%20Control-fungal%20diseases%20(JFBHJO).pdf</u>

3. <u>https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3536260/#:~:text=Molecular%20methods%20using%20PCR%20and,ESI%2DMS%20combined%20with%20PCR.</u>

		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	-	-	1	-	3	3	2	2	-	2	2	-	-	-	-	1
CO2	2	-	-	2	-	3	2	2	1	-	2	3	-	-	-	-	2
CO3	2	-	-	1	-	3	3	1	2	-	1	2	-	-	-	-	1
CO4	2	-	-	1	-	3	3	2	1	-	2	3	-	-	-	-	1
CO5	2	-	-	2	-	3	2	2	1	-	2	2	-	-	-	-	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

Course Code	Course Title		Attributes								
LT313	MEDICAL MYCOLOGY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.		
	MICOLOGI	4	4	4	√		1	4	3,4		



Effective from Sessi	Effective from Session: 2019-20										
Course Code	LT314	Title of the Course	RESEARCH METHODOLOGY & BIOSTATISTICS	L	Т	Р	C				
Year	Ш	Semester	VI	2	1	0	3				
Pre-Requisite	Nil	Co-requisite	Nil								
		objective of this module is to help the students understand the basic principles of research and methods applied to draw									
Course Objectives		ces from the research findings. The students will also be made aware of the need of biostatistics and understanding of									
-	data, sampli	ng methods, in addition to	being given information about the relation between data and vari	ables.							

	Course Outcomes
CO1	The student will be taught about Research Methodology, Basic concept.
CO2	The student will be taught about Data- Research tools and Data collection methods
CO3	The student will be taught about data in biostatistics,
CO4	The student will be taught about Distribution, Standard deviation, Standard errors. Coefficient of Variation, t-test, x
CO5	The student will be taught about statistical analysis,

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO							
1	Research Methodology	Research Methodology: Introduction to research methods, Identifying research problem. Ethical issues in research-Research design, Basic Concepts of Biostatistics	6	CO1							
2	Research Development	Types of Data- Research tools and Data collection methods, sampling methods, Developing a research proposal.	6	CO2							
3	Type of variables: defining data set, Collection of relevant data: sampling methods.										
4	Distribution, Distribution, Standard deviation, Standard errors. Coefficient of Variation, t-test, Chi square test.										
5	Construction of Study:	Construction of study: population, sample, normality and its beyond (not design of study, perhaps), Summarizing data on the pretext of underlined study. Understanding of statistical analysis (not methods).	6	CO5							
	ence Books:										
	atistical Methods by S.P. G										
		edical students by B.K.Mahajan									
	PG Biostatistics by Himans	nu Tyagi.									
	earning Source:										
1. l	https://www.researchgate.ne	t/publication/303381524 Fundamentals of research methodology and data collection									
2. <u>I</u>	nttps://en.wikipedia.org/wik	i/Biostatistics									
3. I	https://www.nordp.org/what	-is-research-development-									
	Course Articulation Matrix: (Mapping of COs with POs and PSOs)										

			Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
	PO-PSO	PO1	PO2	PO3	PO4	DO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
	СО	FUI	FO2	FUS	F04	FUS	FUU	F07	FUo	F09	FOID	FOIL	F012	1301	F302	1303	F304	1303
	CO1	-	-	-	-	-	2	-	2	-	-	-	2	-	-	-	-	-
	CO2	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-
	CO3	-	-	-	-	-	2	-	1	-	1	-	2	-	-	-	-	-
Γ	CO4	-	-	-	-	-	2	2	-	-	-	-	2	-	-	-	-	-
	CO5	-	-	-	-	-	2	1	1	-	-	1	2	-	-	-	1	1
							a				a .			10				

	Course Code	Course Title		Attributes									
	LT314	RESEARCH	Employability	Entrepreneurship	Skill	Gender	Environment &	Human	Professional	No.			
		METHODOLOGY &	Employability	Entrepreneursnip	Development	Equality	Sustainability	Value	Ethics				
		BIOSTATISTICS			4					3,4, 11			



Effective from Session	n: 2019-20										
Course Code	LT315	Title of the Course	CYTOPATHOLOGY & CYTOTECHNIQUES- LAB	L	Т	Р	С				
Year	III	Semester	VI	0	0	2	1				
Pre-Requisite	NIL	NIL Co-requisite Nil									
Course Objectives	The objective of thi	is module is to help the	students understand about Collection, investigation, general	& sp	ecial st	ain use	d in				
Course Objectives	Cytopathological T	echnique.									

	Course Outcomes
CO1	The student will study about various cytopathological sample collection.
CO2	The student will study about various cytological fixatives and fixations.
CO3	The student will study about cryostat sectioning, its applications in diagnostic cytopathology.
CO4	The student will study about cervical screening, Equipment's & its procedure
CO5	The student will study about special stains used in cytology:

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO								
1	Sample collection	1. Sample collection of various Cytopathological Specimens.		CO1								
2	PAP-smear	2. To perform Papnicolaou's stain on cervical smear.		CO2								
3	Cryostat-Sectioning	3. To cut frozen sections of Gynaec tissue.	20	CO3								
4	CSF-Cytology	4. To perform CSF sample and body fluids by cytospin.	20	CO4								
5	Cytological Stain	5. Should know the various stains used in Cytology lab: May Grunwald Giemsa, H&E, PAS, Grocott's.		CO5								
Referen	ce Books:											
1. Hand	book of Histopathological	Techniques by C F A Culling.										
2. Med	ical Lab technology by Lyn	ch.										
3. An I	ntroduction to Medical Lab	Technology by F J Baker and Silverton.										
4. Banc	croft 's Theory and Practice	of Histopathological Techniques by John D Bancroft.										
5. Diag	nostic Cytology by Koss V	olume -II.										
e-Lear	e-Learning Source:											
1	1 https://www.sciencedirect.com/topics/medicine-and-dentistry/cytopathology											

2 https://www.thieme-connect.com/products/ejournals/pdf/10.1055/s-0039-1693098.pdf
 3 https://www.slideserve.com/tevy/cytology-of-body-fluid

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		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO							- • .		/								
CO1	1	3	1	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO2	1	3	2	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO3	1	3	1	2	-	-	-	1	1	1	-	3	2	1	1	1	1
CO4	2	3	1	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO5	1	3	1	2	-	-	-	1	1	1	-	3	2	1	1	1	1

			Attribu	tes & SDGs							
Course Code	Course Code Course Title Attributes										
LT315	CYTOPATHOLOGY & CYTOTECHNIQUES-	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.		
	LAB	4	1	1	4		1	*	3,4		



Effective from Sessio	n: 2019-20												
Course Code	LT316	Title of the Course	CLINICAL ENDOCRINOLOGY & TOXICOLOGY-LAB	L	Т	Р	С						
Year	III	Semester	VI	0	0	2	1						
Pre-Requisite	Nil	Co-requisite	Nil										
Course Objectives	The objective	bjective of this module is to help the students understand about Determination of various Hormones.											

	Course Outcomes
CO1	The student will study about determine T3, T4, TSH hormones conc. in serum sample.
CO2	The student will study about determine LH, PRL, FSH hormones conc. in serum sample.
CO3	The student will study about perform TRIPLE test.
CO4	The student will study about of Male & Female infertility test.
CO5	The student will study about determine BHCG hormones.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO							
1	Determination of T3 conc	1. To determine T3 conc. in serum sample		CO1							
2	Determination of T4 conc	2. To determine T4 conc. in serum sample		CO1							
3	Determination of TSH conc	3. To determine TSH conc. in serum sample		CO2							
4	Determination of LH conc	4. To determine LH conc. in serum sample		CO2							
5	Determination of FSH conc	5. To determine FSH conc. in serum sample	30	CO3							
6	Determination of PRL conc	6. To determine Prolactin conc. in serum sample	50	CO3							
7	Determination TRIPLE TEST	7. To perform TRIPLE test		CO4							
8	Determination of Male & female infertility Hormone	8. Demonstration of male and female infertility test		CO4							
9	Determination of BHCG	9. Beta HCG.		CO5							
Referen	nce Books:										
1. Te	tz (2007), fundamental of clinical	chemistry,6 th edition Elsevier Publications.									
2. Bis	son (2013), Clinical chemistry, 7th	edition, wiley Publication.									
3. He	nry's clinical diagnosis and manag	gement by laboratory methods (2011), 22 nd edition, Elsevier.									
4. D	M Vasudevan (2011), text book of m	nedical biochemistry, 8 th edition Jaypee Brothers.									
		textbook of medical biochemistry, 8th edition Jaypee Publications.									
6. Sir	ngh & Sahni (2008), Introductory Pra	actical Biochemistry, 2 nd edition, alpha Science.									
e-Learr	Singh & Sami (2000), infoductory Practical Biochemisary, 2 - canon, april Science.										

1. https://byjus.com/biology/hormones/

2. <u>https://docs.google.com/presentation/d/11DhZilsAs_n_hte5NqSQ30TV1RnMQOk5/edit?usp=share_link&ouid</u> =116700992000575491834&rtpof=true&sd=true

3. <u>https://www.slideshare.net/TSOLEMAN/1-introduction-15583147</u>

		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
СО	101	102	105	104	105	100	107	100	10)	1010	1011	1012	1501	1502	1505	1504	1505
CO1	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	1
CO2	1	3	1	3	-	-	-	1	3	-	-	3	3	2	-	1	1
CO3	1	3	1	2	-	-	-	1	2	-	-	2	3	1	-	1	1
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	1
CO5	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	1

			Attilbu								
Course Code	Course Title		Attributes								
LT316	CLINICAL ENDOCRINOLOGY &	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.		
	TOXICOLOGY- LAB	4	4	4	A		4	4	3,4		



Effective from Session:	2019-20										
Course Code	LT317	Title of the Course	CLINICAL VIROLOGY & MEDICAL MYCOLOGY- LAB	L	Т	Р	С				
Year	III	Semester	VI	0	0	2	1				
Pre-Requisite	Nil	Co-requisite	Nil								
Course Objectives	The object	objective of this module is to help the students understand about Identification and diagnosis of various viral infection,									

	Course Outcomes: After the successful course completion, learners will develop following attributes:
CO1	The student will study about Structure of viruses and their multiplication
CO2	The student will study about various staining procedures for diagnosis of viral infections.
CO3	The student will study about Card test for Viral Marker.
CO4	The student will study about Elisa test for Viral marker
CO5	The student will study about mould culture by performing various identification techniques studied in theory

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Structure of viruses	1. To demonstrate structure of viruses and their multiplication from charts etc		CO1
2	Staining procedures	2. To perform Giemsa stain, Seller 's stain, immunofluorescent staining procedures for diagnosis of viral infections.		CO1
3	Card test	3. Card test for Viral Marker.		CO2
4	ELISA	4. Elisa for Viral marker		CO2
5	Culture Media	5. To prepare culture media used routinely in mycology	30	CO3
6	Preparation of stain	6. To perform KOH preparation, Gram stain, Potassium Hydroxide - Calcofluor White method, India Ink preparation, Modified Kinyoun Acid Fast Stain for Nocardia, LCB preparation	50	CO3
7	Identification of Viruses	7. To identify given yeast culture by performing various identification techniques studied in theory.		CO4
8	Identification of Viruses	8. To identify given mould culture by performing various identification techniques studied in theory		CO5
Referen	ce Books:			
1. Practica	al Medical Microbiolog	gy by Mackie & Mac Cartney Volume 1 and 2.		
	ook of Microbiology by			
3. Medica	ll Microbiology by Pan	ikar & Satish Gupte.		

4. Medical laboratory Technology Vol. I, II, III by Mukherjee

5. Medical Laboratory manual for tropical countries Vol. II Microbiology by Monica Cheesbrough Medical Mycology by Dr. Jagdish Chander

e-Learning Source:

1. <u>https://www.ncbi.nlm.nih.gov/books/NBK8098/</u>

2. https://www.nature.com/articles/s41579-021-00535-6

https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/oncogenic-viruses

3.

		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
СО	101	102	105	104	105	100	107	100	10)	1010	1011	1012	1501	1502	1505	1504	1505
CO1	2	3	-	2	1	-	-	-	1	1	-	1	2	1	3	2	1
CO2	1	3	-	2	-	-	-	-	1	-	-	1	2	1	3	2	1
CO3	2	3	-	2	-	-	-	-	1	1	-	1	2	1	3	2	1
CO4	1	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1
CO5	2	3	-	1	-	-	_	-	1	-	-	1	2	1	3	2	1
				1 T.	Con	malatia		/ a d a ma	to Com	ualation.	2 C		Comula				

Course Code	Course Title			Att	ributes				SDGs
LT317	CLINICAL VIROLOGY & MEDICAL	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.
	MYCOLOGY- LAB	4	1	4	٦		4	1	3,4



Effective from Session:	2019-20											
Course Code	LT318	Title of the Course	HOSPITAL POSTING- LAB	L	Т	Р	С					
Year	III	Semester	VI	0	0	12	6					
Pre-Requisite	Nil	Nil Co-requisite Nil										
Course Objectives	The student v	ne student will be taught about different type of Clinical laboratory work according to respective SOPS.										

	Course Outcomes: After the successful course completion, learners will develop following attributes:
CO1	Students are study about various specimen sample collection
CO2	Students are study about sample accountability
CO3	Students are study about laboratory -quality management system
CO4	Students are study about Calibration and Validation of Clinical Laboratory instruments
CO5	Students are study about various clinical test Reporting results.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO						
1		1. Clinical sample collection e.g., Blood, Urine, Stool, Saliva, Sputum.		CO1						
2		2. Sample accountability- Labeling of sample, Making entries in Laboratory records.		CO1						
3		3. Reporting results- Basic format of a test report, Release of examination results, Alteration in reports.		CO2						
4	Hospital Posting	4. Quality Management system- Quality assurance, Internal and External quality control, Quality improvement.	150	CO2						
5	Hospital Posting	5. Biomedical waste management in a clinical laboratory - Disposal of used samples, reagents and other biomedical waste.	150	CO3						
6		6. Calibration and Validation of Clinical Laboratory instruments.		CO3						
7		7. Ethics in medical laboratory practice in relation to the following-		CO4						
8		8. Pre-Examination procedures, Examination procedures, reporting of results, Preserving medical records, Access to medical laboratory records.		CO5						
Referen	ice Books:									
1. Han	dbook of Histopatho	logical Techniques by C F A Culling								
2. Mec	dical Lab technology	by Lynch								
		cal Lab Technology by F J Baker and Silverton								
		Practice of Histopathological Techniques by John D Bancroft								
	gnostic Cytology by									
e-Leai	e-Learning Source:									
1. https	s://docs.google.com/prese	ntation/d/1wFllcX0tvZ_BUAB1nDhstmj9KLU0-								
<u>3Fb/</u>	edit?usp=share_link&oui	d=106521868798423984598&rtpof=true&sd=true								
0 1				i						

- 2. https://en.wikipedia.org/wiki/Complete blood count

3. https://www.hopkinsmedicine.org/health/conditions-and-diseases/g6pd-glucose6phosphate-dehydrogenase-deficiency#:~:text=G6PD%20deficiency%20is%20an%20inherited,enzyme%20can%20cause%20hemolytic%20anemia.

		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	-	2	1	-	-	-	1	1	-	1	2	1	3	2	1
CO2	1	3	-	2	-	-	-	-	1	-	-	1	2	1	3	2	1
CO3	2	3	-	2	-	-	-	-	1	1	-	1	2	1	3	2	1
CO4	1	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1
CO5	2	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1

2- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

				110011.50						
Co	ourse Code	Course Title			Att	ributes				SDGs
	LT318	HOSPITAL POSTING-	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.
		LAB	1	√	↓ ↓	√		1	4	3,4