INTEGRAL UNIVERSITY, LUCKNOW

INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

BACHELOR OF MEDICAL LABORATORY SCIENCE (BMLS)

SYLLABUS

YEAR/ SEMESTER: III/V

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

Program: BMLS Semester-V

S. N.	Course code	Course Title	Type of Paper	Period Per hr/week/sem			Evaluation Scheme				Sub. Total	Credit	Total Credits
				L	T	P	CT	TA	Total	ESE			
THEORIES													
1	LS301	General & Clinical Pathology	Core	3	1	0	40	20	60	40	100	3:1:0	4
2	LS302	Blood Banking & Genetics	Core	2	1	0	40	20	60	40	100	2:1:0	3
3	LS303	Analytical Biochemistry	Core	2	1	0	40	20	60	40	100	2:1:0	3
4	LS304	Medical Parasitology	Core	2	1	0	40	20	60	40	100	2:1:0	3
PRACTICAL													
1	LS305	Seminar	Core	0	3	0	40	20	60	40	100	0:3:0	3
2	LS306	Blood Banking & Genetics- Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3	LS307	Analytical Biochemistry- Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
4	LS308	Medical Parasitology - Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
5	LS309	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. N.	Course code	Course Title	Type of Paper	Attributes							United Nation Sustainable Development Goal (SDGs)
				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
THEORIES											
1	LS301	General & Clinical Pathology	Core	√	√	√			√	√	3,4
2	LS302	Blood Banking & Genetics	Core	√	√	√	√		√	√	3,4
3	LS303	Analytical Biochemistry	Core	√	√	√	√		√	√	3,4
4	LS304	Seminar	Core	√	√	√	√		√	√	3,4
5	LS305	Medical Parasitology	Core	√	√	√	√		√	√	3,4
PRACTICAL											
1	LS306	Blood Banking & Genetics- Lab	Core	√	√	√	√		√	√	3,4
2	LS307	Analytical Biochemistry- Lab	Core	√	√	√	√		√	√	3,4
3	LS308	Medical Parasitology - Lab	Core	√	√	√	√		√	√	3,4
4	LS309	Hospital Posting - Lab	Core	√	√	√	√		√	√	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 **Subject Total:** Sessional Total + End Semester Examination (ESE)

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS301**	**Title of the Course**	**GENERAL & CLINICAL PATHOLOGY**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**3**	**1**	**0**	**4**
Pre-Requisite	**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 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 behavior: 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

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
5. Atlas of Hematology by G.A.McDonald

e-Learning Source:

1. https://www.slideshare.net/appyakshay/cell-injury-75140470
2. https://www.webmd.com/arthritis/about-inflammation
3. https://slideplayer.com/slide/7094661/

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	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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
LS301	GENERAL & CLINICAL PATHOLOGY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√			√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS302**	**Title of the Course**	**BLOOD BANKING & GENETICS**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**2**	**1**	**0**	**3**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	Blood banking will make students learn about blood grouping &blood, Transfusion. The students will learn about the concept of blood grouping, compatibility testing in blood transfusion &screening of donated blood for various Infection Diseases. Genetics will make students learn about Fundamentals of Heredity. The students will learn about the concept of inheritance in various genetic diseases.						

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: P**reparation, 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**	**Transfusion reactions**- Laboratory investigation of transfusion reactions and mismatched, transfusion reactions. Compatibility tests in blood transfusion, complications and hazard of blood transfusion. Transfusion transmissible diseases**,** screening methods (Sample collection, processing, handling and disposal).	6	CO3
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

Reference Books:

1. Practical Hematology by J.B. Dacie.
2. Transfusion Science by Overfield, Hame.
3. Medical Laboratory Technology by K.L. Mukherjee Volume-I.
4. Mollison's Blood Transfusion in Clinical Medicine, 12th Edition by Harvey G. Klein.
5. Genes by Benjamin Lewin.
6. Genetics by B. D. Singh.

e-Learning Source:

1. https://www.healthline.com/health/blood-typing-and-crossmatching
2. https://www.slideshare.net/peddanasunilkumar/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	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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
LS302	BLOOD BANKING & GENETICS	✓	✓	✓	✓		✓	✓	3,4

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS303**	**Title of the Course**	**ANALYTICAL CLINICAL BIOCHEMISTRY**	**L**	**T**	**P**	**C**
Year	**II**	**Semester**	**III**	**2**	**1**	**0**	**3**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	This course deals with fundamentals of metabolism, metabolic disorders, laboratory test and instruments of Clinical Biochemistry.						

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 understanding 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

Reference Books:

1. Practical Clinical Biochemistry by Harold Varley.
2. Medical Laboratory Technology by Mukherjee.
3. Text book of Medical Laboratory Technology by P. B. Godker
4. Principal of Biochemistry by M. A.Siddiqi.
5. Instrumental Analysis by ChatwalAnand.
6. Text book of Medical Biochemistry by Chatterjee,Shinde..
7. Biochemistry by Voet & Voet.
8. Principal of Biochemistry by Lehninger.
9. Biochemistry by Voet & Voet.

e-Learning Source:

1. https://www.spcmc.ac.in/wp-content/uploads/2021/04/UV-VIS_Part-1.pdf
2. https://en.wikipedia.org/wiki/Chromatography
3. https://soe.unipune.ac.in/studymaterial/ashwiniWadegaonkarSelf/BSC%20821%20Ch%205.pdf

	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	-

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
LS303	ANALYTICAL CLINICAL BIOCHEMISTRY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS304**	**Title of the Course**	**MEDICAL PARASITOLOGY**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**2**	**1**	**0**	**3**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The student will be taught about introduction, general characteristics, life cycle and laboratory diagnosis of various medically important parasites.						

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 classification, Geographical distribution, Habitat, Morphology, lifecycle, Mode of infection and laboratory diagnosis of Entamoeba sp. E. Histolytica, Free-living 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, Leishmania and Toxoplasma sp.	6	CO1
2	**HELMINTHOLOGICAL**	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, Trichinella aspirales,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. Concentration techniques i.e., Flotation and sedimentation techniques, egg counting techniques. General rules for microscopic examination of stool samples, Examination of Stool for parasites for intestinal protozoal infections, For Helminthic infections. Examination of blood for parasite, preparation of thin and thick blood film, leishman staining, examination of thick and thin smear, field's stain, JSB stain.	6	CO3
4	**SLIDE PREPARATION**	Biomedical waste management in a medical microbiology laboratory, types of waste generated, segregation treatment, disposal.	6	CO4
5	**SAMPLES**	Clinical case studies of various protozoal and helminthic infections with special focus on identification strategies of above mentioned parasites.	6	CO5

Reference Books:

1. Parasitology in relation to Clinical Medicine by K D Chatterjee.
2. Medical Entomology by A.K. Hati, Pub. Allied Book Agency.
3. Medical Parasitology by D.R.Arora
4. Clinical Parasitology by Paul Chester Beaver.

e-Learning Source:

1. https://www.ncbi.nlm.nih.gov/books/NBK8262/
2. https://en.wikipedia.org/wiki/Helminthology
3. https://onlinelibrary.wiley.com/doi/abs/10.1128/9781555817381.ch133

	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	-	-	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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
LS305	MEDICAL PARASITOLOGY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS305**	**Title of the Course**	**SEMINAR**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**0**	**3**	**0**	**3**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	This curriculum imparts the knowledge of various types of diseases and functioning of various programs.						

Course Outcomes	
CO1	Student will be able to present seminar under concern topic in places like conferences, workshops, meets etc.
CO2	Student will have the knowledge on Power point presentation.
CO3	Student will have the presentation skill.
CO4	Student will have the knowledge on how to prepare a presentation for any event.
CO5	Student will be able to organize a Seminar, Webinar & Workshop.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**SEMINAR**	Each student will be assigned topics for presentations as seminars, will explore recent innovations in the department of Medical Laboratory Sciences for presenting topics during Seminar and shall be holding group discussions along with in the presence of faculty.	60	CO1-5

Reference Books:

1. Medical Laboratory Technology by Mukherjee.
2. Text book of Medical Laboratory Technology by P. B. Godker
3. Practical Hematology by J.B. Dacie.
4. Transfusion Science by Overfield, Hame.
5. Textbook of Medical Laboratory Technology by Praful B. Godkar.

e-Learning Source:

	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	-	-	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

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

Attributes & SDGs

Course Code	**Course Title**	**Attributes**							**SDGs No.**
LS304	SEMINAR	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	**3,4**
		✓	✓	✓	✓		✓	✓	

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS306**	**Title of the Course**	**BLOOD BANKING & GENETICS- LAB**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**0**	**0**	**2**	**1**
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.						

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.	30	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.		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

Reference Books:

1. Practical Hematology by J.B. Dacie
2. Mollison's Blood Transfusion in Clinical Medicine
3. Medical Laboratory Technology by K.L. Mukherjee Volume-
4. Transfusion Science by Over field, Hamer

e-Learning Source:

1. https://www.healthline.com/health/blood-typing-and-crossmatching
2. https://www.slideshare.net/peddanasunilkumar/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	-

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
LS306	BLOOD BANKING & GENETICS- LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS307**	**Title of the Course**	**ANALYTICAL CLINICAL BIOCHEMISTRY- LAB**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**0**	**0**	**2**	**1**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The student 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	Students are study about principle, working & maintenance of flame photometer.
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.	30	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.		CO3
5	**GAS CHROMATOGRAPHY**	5. To demonstrate the principle & procedure of gas chromatography		CO3
6	**TLC**	6. To demonstrate the principle & demonstration of TLC.		CO4
7	**COLUMN CHROMATOGRAPHY**	7. To demonstrate the principle & procedure of column chromatography.		CO5
8	**ELECTROPHORESIS**	8. To demonstrate the principle & procedure of Electrophoresis.		CO5

Reference Books:

1. Practical Clinical Biochemistry by Harold Varle.
2. Text book of Medical Laboratory Technology by P. B. Godker
3. Medical Laboratory Technology by Mukherjee.
4. Principal of Biochemistry by M. A. Siddiqi.
5. Instrumental Analysis by Chatwal Anand.
6. Text book of Medical Biochemistry by Chatterjee, Shinde.
7. Principal of Biochemistry by Lehninger.
8. Biochemistry by Voet & Voet.

e-Learning Source:

1. https://www.spcmc.ac.in/wp-content/uploads/2021/04/UV-VIS_Part-1.pdf
2. https://en.wikipedia.org/wiki/Chromatography
3. https://soe.unipune.ac.in/studymaterial/ashwiniWadegaonkarSelf/BSC%20821%20Ch%205.pdf

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
LS307	ANALYTICAL CLINICAL BIOCHEMISTRY- LAB	✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS308**	**Title of the Course**	**MEDICAL PARASITOLOGY - LAB**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**0**	**0**	**2**	**1**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The student will be taught about laboratory diagnosis of various medically important parasites & microscopy.						

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	**PARASITOLOGY HELMINTHOLOGICAL DIAGNOSTIC PROCEDURE SLIDE PREPARATION SAMPLES**	1. Routine stool examination for detection of intestinal parasites with concentration methods.	30	CO1
2		2. Saline preparation, Iodine preparation, Floatation method Centrifugation method, Formal ether method, Zinc sulphate method.		CO2
3		3. Identification of adult worms from models/slides.		CO3
4		4. Tapeworm, Tapeworm segments, Ascaris (Round worm), Hookworms, Pinworms.		CO3
5		5. Malarial parasite.		CO4
6		6. Preparation of thin and thick smears, Staining of smear, Examination of smears for malarial parasites (P. vivax and P. falciparum).		CO5

Reference Books:

1. Parasitology in relation to Clinical Medicine by K D Chatterjee.
2. Medical Entomology by A.K. Hati, Pub. Allied Book Agency.
3. Medical Parasitology by D.R. Arora.
4. Clinical Parasitology by Paul Chester Beaver.

e-Learning Source:

1. https://www.ncbi.nlm.nih.gov/books/NBK8262/
2. https://en.wikipedia.org/wiki/Helminthology
3. https://onlinelibrary.wiley.com/doi/abs/10.1128/9781555817381.ch133

	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	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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
LS308	MEDICAL PARASITOLOGY - LAB	✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS309**	**Title of the Course**	**HOSPITAL POSTING- LAB**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**0**	**0**	**12**	**06**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The student will be taught about different type 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	**HOSPITAL POSTING**	1. Determination of hemoglobin by various methods.	150	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		8. Differential Leucocyte Count.		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. To perform APTT.		CO4
13		13. To perform sickling test.		CO5
14		14. Determination of Plasma Hemoglobin.		CO5
15		15. To perform 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. 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	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	Attributes							SDGs No.
LS206	**HOSPITAL POSTING-LAB**	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		✓	✓	✓	✓		✓	✓	**3,4**

INTEGRAL UNIVERSITY, LUCKNOW

INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

BACHELOR OF MEDICAL LABORATORY SCIENCE (BMLS)

SYLLABUS

YEAR/ SEMESTER: III/VI

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

Program: BMLS Semester-VI

S. N.	Course code	Course Title	Type of Paper	Period Per hr./week/Sem.			Evaluation Scheme				Sub. Total	Credit	Total Credits
				L	T	P	CT	TA	Total	ESE			
THEORIES													
1	LS310	Cytopathology & Cytotechniques	Core	3	1	0	40	20	60	40	100	31:0	4
2	LS311	Clinical Endocrinology & Toxicology	Core	2	1	0	40	20	60	40	100	3:1:0	3
3	LS312	Clinical Virology	Core	2	1	0	40	20	60	40	100	3:1:0	3
4	LS313	Medical Mycology	Core	2	1	0	40	20	60	40	100	2:1:0	3
5	LS314	Research Methodology & Biostatistics	Core	2	1	0	40	20	60	40	100	2:1:0	3
PRACTICAL													
1	LS315	Cytopathology & Cytotechniques-Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
2	LS316	Clinical Endocrinology & Toxicology - Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3	LS317	Clinical Virology & Medical Mycology -Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
4	LS318	Hospital Posting - Lab	Core	0	0	12	40	20	60	40	100	0:0:6	6
Total				**11**	**05**	**18**	**360**	**180**	**540**	**400**	**900**	**25**	**25**

S. N.	Course code	Course Title	Type of Paper	Attributes							United Nation Sustainable Development Goal (SDGs)
				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
THEORIES											
1	LS310	Cytopathology & Cytotechniques	Core	√	√	√	√		√	√	3,4
2	LS311	Clinical Endocrinology & Toxicology	Core	√	√	√	√		√	√	3,4
3	LS312	Clinical Virology	Core	√	√	√	√		√	√	3,4
4	LS313	Medical Mycology	Core	√	√	√	√		√	√	3,4
5	LS314	Research Methodology & Biostatistics	Core	√		√		√	√	√	3,4, 11
PRACTICAL											
1	LS315	Cytopathology & Cytotechniques-Lab	Core	√	√	√	√		√	√	3,4
2	LS316	Clinical Endocrinology & Toxicology - Lab	Core	√	√	√	√		√	√	3,4
3	LS317	Clinical Virology & Medical Mycology -Lab	Core	√	√	√	√		√	√	3,4
4	LS318	Hospital Posting - Lab	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)

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS310**	**Title of the Course**	**CYTOPATHOLOGY & CYTOTECHNIQUES**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**VI**	3	1	0	**4**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The students will learn about various staining procedures for demonstration of different substances & various cytological investigations. This will include special staining procedures &handling & testing of various cytological specimens.						

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. **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 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

	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	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

Attributes & SDGs

Course Code	**Course Title**	**Attributes**							**SDGs No.**
LS310	CYTOPATHOLOGY & CYTOTECHNIQUES	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS311**	**Title of the Course**	**CLINICAL ENDOCRINOLOGY & TOXICOLOGY**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**VI**	2	1	0	**3**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The students will learn about various Hormones male & Females Classification, Mechanism of action, Secretion 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
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, Mercurypoisoning drugs abuse, screening procedure for drug screening, Spot tests, hair and urine test, Immunoassay for drugs.	6	CO5

Reference Books:

1. Teitz (2007), fundamental of clinical chemistry,6th edition Elsevier Publications.
2. Bison (2013), Clinical chemistry, 7th edition, wiley Publication.
3. Henry's clinical diagnosis and management by laboratory methods (2011), 22nd edition, Elsevier.
4. D M Vasudevan (2011), text book of medical biochemistry, 8th edition Jaypee Brothers.
5. M N Chatterjee & Rana Shinde (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 / 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	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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
LS311	CLINICAL ENDOCRINOLOGY & TOXICOLOGY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS312**	**Title of the Course**	**CLINICAL VIROLOGY**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**VI**	**2**	**1**	**0**	**3**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The student will be taught about introduction, general characteristics, life cycle and laboratory diagnosis of various Medically 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 theUnit	Content of Unit	Contact Hrs.	Mapped CO
1	**INTRODUCTIONTO MEDICAL VIROLOGY**	• Introduction to medical virology. Introduction to medically important viruses. Structure andClassification of viruses. • Multiplication of viruses.	6	CO1
2	**VIRAL DIAGNOSIS**	• Collection, transportation and storage of sample for viral diagnosis. Staining techniquesused in Virology • Processing of samples for viral culture (Egg inoculation and tissue culture), viral identification techniques commonly used in diagnostic lab.	6	CO2
3	**MODES OF VIRAL TRANSMISSION**	Host virus interaction. Modes of viral transmission: Persistent, non-persistent, vertical and horizontal Viralmultiplication and replication strategies: Interaction of viruses with cellular receptors and entry of viruses. Assembly, maturation and release of virions.	6	CO3
4	**VIRUSES-PROPHYLAXISAND 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, COVID-19.	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

Reference Books:

1. Medical Laboratory manual for tropical countries Vol. II Microbiology byMonica Chees brough
2. Medical laboratory Technology Vol. I, II, III by Mukherjee
3. Medical Microbiology by Panikar& Satish Gupte
4. Text book of Microbiology by Ananthanarayanan
5. Practical Medical Microbiology by Mackie &MacCartney Volume 1 and 2

e-Learning Source:

1. https://www.ncbi.nlm.nih.gov/books/NBK8098/
2. https://www.nature.com/articles/s41579-021-00535-6

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

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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
LS312	CLINICAL VIROLOGY	✓	✓	✓	✓		✓	✓	3,4

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS313**	**Title of the Course**	**MEDICAL MYCOLOGY**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**VI**	**2**	**1**	**0**	**3**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The student will be taught about introduction, general characteristics, life cycle and laboratory diagnosis of various medically 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 importantfungi.	6	CO1
2	**MORPHOLOGY OFFUNGI**	Morphological, cultural characteristics of common fungal laboratory contaminantsCulture 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. Aspergillus sp. And Penicillium sp.	6	CO3
4	**MICROSCOPY IN MEDICAL MYCOLOGY LABORATORY**	Direct microscopy in medical mycology laboratory, Processing of clinical samples fordiagnosis of fungal infections i.e., Skin, nail, hair, pus, sputum, CSF and other body fluids.	6	CO4
5	**METHODS FOR IDENTIFICATION OFFUNGI**	Dimorphism in fungi, Antifungalsusceptibility tests. Preservation of fungal cultures, Routine myco-serological tests and skin tests. Clinica cases of common mycological infections.	6	CO5

Reference Books:

1. Text book of Microbiology by Ananthanarayanan.
2. Medical Microbiology by Panikar & Satish Gupte.
3. Medical laboratory Technology Vol. I, II, III by Mukherjee.
4. Medical Laboratory manual for tropical countries Vol. II Microbiology byMonica Cheesbrough
5. Practical Medical Microbiology by Mackie &MacCartney Volume 1 and 2.

e-Learning Source:

1. https://www.uoanbar.edu.iq/eStoreImages/Bank/7748.pdf
2. https://www.appsnet.org/Publications/Brown_Ogle/28%20Control-fungal%20diseases%20(JFBHJO).pdf
3. **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3536260/#:~:text=Molecular%20methods%20using%20PCR%20and,ESI%2DMS%20combined%20with%20PCR.**

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							SDGs No.
LS313	MEDICAL MYCOLOGY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS314**	**Title of the Course**	**RESEARCH METHODOLOGY & BIOSTATISTICS**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**VI**	**2**	**1**	**0**	**3**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The objective of this module is to help the students understand the basic principles of research and methods applied to draw inferences from the research findings. The students will also be made aware of the need of biostatistics and understanding of data, sampling methods, in addition to being given information about the relation between data and variables.						

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 aresearch proposal.	6	CO2
3	**BIOSTATISTICS**	**Biostatistics:** Need of biostatistics**,** what is biostatistics: beyond definition, understanding ofdata in biostatistics**,** How & where to get relevant data**,** Relation between data & variables. Type of variables: defining data set**,** Collection of relevant data: sampling methods.	6	CO3
4	**DISTRIBUTION,**	Distribution, Standard deviation, Standard errors. Coefficient of Variation, t-test, Chi square test.	6	CO4
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 statisticalanalysis (not methods).	6	CO5

Reference Books:

1. Statistical Methods by S.P. Gupta.
2. Methods in biostatistics for medical students by B.K.Mahajan..
3. RPG Biostatistics by Himanshu Tyagi.

e-Learning Source:

1. https://www.researchgate.net/publication/303381524_Fundamentals_of_research_methodology_and_data_collection
2. https://en.wikipedia.org/wiki/Biostatistics
3. https://www.nordp.org/what-is-research-development-

	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	-	2	-	-	-	2	-	-	-	-	-
CO2	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-
CO3	-	-	-	-	-	2	-	1	-	1	-	2	-	-	-	-	-
CO4	-	-	-	-	-	2	2	-	-	-	-	2	-	-	-	-	-
CO5	-	-	-	-	-	2	1	1	-	-	1	2	-	-	-	1	1

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
LS314	RESEARCH METHODOLOGY & BIOSTATISTICS			√					**3,4, 11**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS315**	**Title of the Course**	**CYTOPATHOLOGY & CYTOTECHNIQUES- LAB**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**VI**	0	0	2	1
Pre-Requisite	**NIL**	**Co-requisite**	**Nil**				
Course Objectives	The objective of this module is to help the students understand about Collection, investigation, general & special stain used in Cytopathological Technique.						

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.	20	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.		CO3
4	**CSF-CYTOLOGY**	4. To perform CSF sample and body fluids by cytospin.		CO4
5	**CYTOLOGICAL STAIN**	5. Should know the various stains used in Cytology lab:‖ May Grunwald Giemsa, H&E, PAS, Grocott's.		CO5

Reference Books:

1. Handbook of Histopathological Techniques by C F A Culling.
2. Medical Lab technology by Lynch.
3. An Introduction to Medical Lab Technology by F J Baker and Silverton.
4. Bancroft 's Theory and Practice of Histopathological Techniques by John D Bancroft.
5. Diagnostic Cytology by Koss Volume -II.

e-Learning Source:

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

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	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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
LS315	CYTOPATHOLOGY & CYTOTECHNIQUES-LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS316**	**Title of the Course**	**CLINICAL ENDOCRINOLOGY & TOXICOLOGY- LAB**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**VI**	0	0	2	**1**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The objective 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	30	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		CO3
6	**DETERMINATION OF PRL CONC**	6. To determine Prolactin conc. in serum sample		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

Reference Books:

1. Teitz (2007), fundamental of clinical chemistry,6th edition Elsevier Publications.
2. Bison (2013), Clinical chemistry, 7th edition, wiley Publication.
3. Henry's clinical diagnosis and management by laboratory methods (2011), 22nd edition, Elsevier.
4. D M Vasudevan (2011), text book of medical biochemistry, 8th edition Jaypee Brothers.
5. M N Chatterjee & Rana Shinde (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 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	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

Attributes & SDGs

Course Code	**Course Title**	**Attributes**							**SDGs No.**
LS316	CLINICAL ENDOCRINOLOGY & TOXICOLOGY- LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	**3,4**
		✓	✓	✓	✓		✓	✓	

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS317**	**Title of the Course**	**CLINICAL VIROLOGY & MEDICAL MYCOLOGY- LAB**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**VI**	0	0	2	1
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The 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.	30	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.		CO3
6	**PREPARATION OF STAIN**	6. To perform KOH preparation, Gram stain, Potassium Hydroxide - CalcofluorWhite method, India Ink preparation, Modified Kinyoun Acid Fast Stain for Nocardia, LCB preparation		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

Reference Books:

1. Practical Medical Microbiology by Mackie & Mac Cartney Volume 1 and 2.
2. Text book of Microbiology by Ananth Narayanan.
3. Medical Microbiology by Panikar & 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. https://www.ncbi.nlm.nih.gov/books/NBK8098/
2. https://www.nature.com/articles/s41579-021-00535-6
3. https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/oncogenic-viruses

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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
LS317	CLINICAL VIROLOGY & MEDICAL MYCOLOGY- LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**LS318**	**Title of the Course**	**HOSPITAL POSTING- LAB**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**VI**	0	0	12	6
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The 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	**HOSPITAL POSTING**	1. Clinical sample collection e.g., Blood, Urine, Stool, Saliva, Sputum.	150	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		4. Quality Management system- Quality assurance, Internal and External quality control, Quality improvement.		CO2
5		5. Biomedical waste management in a clinical laboratory - Disposal of used samples, reagents and other biomedical waste.		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, Preservingmedical records, Access to medical laboratory records.		CO5

Reference Books:

1. Handbook of Histopathological Techniques by C F A Culling
2. Medical Lab technology by Lynch
3. An Introduction to Medical Lab Technology by F J Baker and Silverton
4. Bancroft's Theory and Practice of Histopathological Techniques by John D Bancroft
5. Diagnostic Cytology by Koss Volume -II

e-Learning Source:

1. https://docs.google.com/presentation/d/1wFllcX0tvZ_BUAB1nDhstmj9KLU0-3Fb/edit?usp=share_link&ouid=106521868798423984598&rtpof=true&sd=true
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		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

Course Code	Course Title	Attributes							SDGs No.
LS318	HOSPITAL POSTING-LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		✓	✓	✓	✓		✓	✓	**3,4**