VIDYASAGAR UNIVERSITY

Midnapore, West Bengal

PROPOSED CURRICULUM & SYLLABUS (DRAFT) OF

BACHELOR OF MEDICAL LABORATORY TECHNOLOGY -BMLT (HONOURS)

4-YEAR UNDERGRADUATE PROGRAMME

(w.e.f. Academic Year 2023-2024)

Based on

Curriculum & Credit Framework for Undergraduate Programmes (CCFUP), 2023& NEP, 2020

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VIDYASAGAR UNIVERSITY
BACHELOR OF MEDICAL LABORATORY TECHNOLOGY -BMLT (HONOURS)
(under CCFUP, 2023)

Level	YR.	SEM	Course Type	Course Code	Course Title	Credit	L-T-P	Marks		
								CA	ESE	TOTAL
BMLT (Hons.)	3rd	V	SEMESTER-V							
			Major-8	BMLTHMJ08	T: Mycology and Virology; P: Practical	4	3-0-1	15	60	75
			Major-9	BMLTHMJ09	T: Clinical Pathology-2 (Advanced urine and stool pathology); P: Practical	4	3-0-1	15	60	75
			Major-10	BMLTHMJ10	T: Clinical Biochemistry -2; P: Practical	4	3-0-1	15	60	75
			Major Elective-01	BMLTHDSE1	T: Forensic Diagnosis/ Pharmacology and Toxicology	4	3-1-0	15	60	75
			Minor-5	BMLTMIN05	T: Molecular Biology; P: Practical	4	3-0-1	15	60	75
			Semester-V Total			20				375
		VI	SEMESTER-VI							
			Major-11	BMLTHMJ11	T: Haematological and Histological slide analysis; P: Practical	4	3-0-1	15	60	75
			Major-12	BMLTHMJ12	T: Computer application and Health Informatics; P: Practical	4	3-0-1	15	60	75
			Major-13	BMLTTHMJ13	T: Assisted Reproductive Technology and Embryology; P: Practical	4	3-0-1	15	60	75
			Major Elective-02	BMLTHDSE2	T: Oncopathology / Cellular and System pathology	4	3-1-0	15	60	75
			Minor-6	BMLTMIN06	T: Clinical Haematology; P: Practical	4	3-0-1	15	60	75
			Semester-VI Total			20				375
			YEAR-3			40				750
			Eligible to be awarded Bachelor of Medical Laboratory Technology *on Exit*			126	Marks (Year: I+II+III)			2325

MJ = Major, MI = Minor Course, DSE = Discipline Specific Elective Course, CA= Continuous Assessment, ESE= End Semester Examination,
T = Theory, P= Practical, L-T-P = Lecture-Tutorial-Practical

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SEMESTER-V

MAJOR (MJ)

MJ-8: Mycology and Virology **Credits 04(FM: 75)**

Course objective: To explore the study of fungi and viruses, focusing on their identification, pathogenic mechanisms and diagnostic approaches for related infections..

Course outcome: Students will acquire expertise in the classification, pathogenic mechanisms, and diagnostic techniques for both fungal and viral infections.

MJ-8T: Mycology and Virology (Theory) **Credits 03**

Course content:

Mycology

1. Medically important fungi, thermal dimorphism, the WHO fungal priority pathogen list
   2. An outline of the following infectious fungi and their mode of transmission, sign and symptoms, laboratory diagnosis, prevention and treatment: (a) *Histoplasma* spp., (b) *Blastomyces* spp., (c) *Mucor* spp., (d) *Coccidiodes* spp., (e) *Penicillium marneffei*,and (f) Dermatophytes.
2. Antifungal susceptibility testing, mode of action of the following antifungal drugs: Amphotericin B, ketoconazole, fluconazole, caspofungin, and flucytosine.

Virology

1. General structure of viruses, cultivation of viruses, basic concept of lytic and lysogenic life cycles, the WHO's viral priority pathogen list. mode of action of common antivirals
2. An outline of the following medically important viruses and their mode of transmission, sign and symptoms, laboratory diagnosis, prevention and treatment: (a) hepatitis B and C viruses, (b) herpes simplex viruse 1 and 2, (c) varicella-zoster viruses, (d) human papillomavirus, (e) poliovirus, (f) rubella virus, (g) rotavirus, (h) chikungunya virus, (i) dengue fever virus, (j) influenza A and B viruses, (k)SARS virus, and (l) HIV 1 and 2.
3. Mode of action of the following antiviral agents: Amantadine, acyclovir, ritonavir, oseltamivir, and lamivudine.

Suggested Readings

1. Ananthanarayan and Panikar's Textbook of Microbiology, 13e, (2024), Universities Press (India) Pvt. Ltd., ISBN- 13-9789393330659.
2. **Bailey and Scott's Diagnostic Microbiology, 12th edition (2007),** Betty A. Forbes, Daniel F. Sahm and Alice S. Weissfeld; Mosby Elsevier Publishers, ISBN-13: 978-0808923640.

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MJ-8P: Mycology and Virology (Practical) **Credits 01**

Practical contents:

1. Fungal culture techniques, media preparation, and preservation
2. Collection of human skin scraping, hair plucking, nail clipping for fungal culture
3. Laboratory isolation and identification of *Candida*, *Aspergillus*, *Penicillium*, *Mucor*, and Dermatophytes
4. Identification of fungal structures by KOH preparation and lactophenol cotton blue stain
5. Sample collection techniques for viral infections in viral transport medium (VTM): Nasopharyngeal, oropharyngeal, throat, and rectal swabs
6. Rapid diagnostic tests of viral infections directly from clinical specimens: HIV TRI-DOT, Triple H test, Combo test for viral gastroenteritis (rota, adeno, noro, and astrovirus). Combo test for COVID-19/Influenza A+B.
7. Demonstration on virus culture by plaque assay

Suggested Readings

1. Mackie & Mccartney Practical Medical Microbiology. 14e, (2006), J.G. Collee, A.G. Fraser, B.P. Marmion, A. Simmons; Elsevier, ISBN-9788131203934
2. Practical Medical Microbiology (2008), R. Panjarathinam; Jaypee Brothers Medical Publishers, ISBN- 13-9788184486988.

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MJ-9: Clinical Pathology-2 (Advanced urine and stool pathology) Credits 04(FM: 75)

Course objective: To enhance students' knowledge and skills in the advanced analysis of urine and stool samples for diagnosing various diseases and disorders.

Course Outcome: The Clinical Pathology course prepares students to accurately diagnose and interpret laboratory results for various diseases, enhancing their clinical decision-making and patient care skills.

MJ-9T: Clinical Pathology-2 (Advanced urine and stool pathology) (Theory) Credits 03

Course content:

1. Renal function: enuresis, creatinine clearance test, free water clearance, GFR, nocturia, oliguria, osmolality, osmolar clearance, polyuria, polydipsia, renal blood flow, renal clearance, measurement of solute composition, osmolality, assessment of renal concentrating ability, osmolality vs specific gravity. Measurement of specific gravity by advance technique. Screening for albuminuria,myoglobinuria. Oral ammonium chloride test, clinical significance of urinary pH and its assessment.
2. Clinical significance of leukocyte esterase and its determination.
3. Proteinuria: nephrotic syndrome and its type, overflow proteinuria, post renal proteinuria, orthostatic proteinuria, pyuria, renal proteinuria, tubular proteinuria. Bence Jones protein in urine and its estimation. Microalbuminuria and its detection.
4. The description of crystals due to medications and its metabolites: ampicillin, sulfonamides, radiographic contrast media generated urinary crystal after X-ray.
5. Miscellaneous formed elements: mucus threads bacteria, yeast, fat, spermatozoa. Vaginal contaminants in urine sample.
6. Fecal contaminant in urine sample.
7. Fecal Fat - Significance and assessment.
8. Parasites of stools: *Trichomonusvaginallis, Enterobius vermicularis* (pinworm) intestinal ova and parasites. Concentration procedures of fecal materials for O&P exam.
9. Stool culture process and analysis for detection of pathogens.
10. Stool analysis for gastrointestinal infections (diarrhea, dysentery) and gastrointestinal disorders (malabsorption syndromes, GI bleeding, inflammatory bowel diseases, and colorectal cancer screening).

MJ-9P: Clinical Pathology-2 (Advanced urine and stool pathology) (Practical) Credits 01

1. Specific gravity measurement of urine by urinometer and refractometer (for extremely small volume of sample).
2. Diazo tab test.
3. Classic Ehrlich’s reaction for urobilinogen screening
4. Bilirubin, urobilinogen, porphobilinogen detection in urine.
5. Preparation of and identification of specific components in urinary sediments by following staining techniques: Supra vital stain, acetic stain, fat or lipid stain, prussian blue reaction, hans stain

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6. Identification of casts, crystals and other microscopic components under microscope.
7. Use of urine microscopy atlas, readily made fixed slide to compare above microscopic identification.
8. Bence Jones protein in urine and its estimation.
9. Microalbuminuria and its detection.
10. Renal clearance, measurement of solute composition.
11. Fecal fat analysis using Sudan III staining.
12. Fecal material concentration technique, sedimentation and flotation technique.
13. Permanent stained smear of intestinal protozoa.
14. Cellophane Tape collection method of pinworm.

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MJ-10: Clinical Biochemistry (Advanced) Credits 04(FM: 75)

Course objective: To provide students with a comprehensive understanding of biochemical principles and techniques used to diagnose and monitor various clinical conditions and metabolic disorders.

Course Outcome: This syllabus provides a comprehensive understanding of advanced concepts in clinical biochemistry, emphasizing laboratory skills and clinical applications to enhance patient care and diagnostic accuracy.

MJ-10T: Clinical Biochemistry (Advanced) -Theory Credits 03

Course content:

1. Isoform of clinically important enzymes.
2. Disorders of lipid metabolism: Hyperlipidemia, atherosclerosis, NAFLD, NASH, alcoholic fatty liver disease.
3. Diabetes types, Biochemical complications of diabetes (ketoacidosis, hyperglycemia- Significance of C-peptide, leptin, ghrelin, adiponectin and assessment).
4. Types of jaundice and Pathophysiology.
5. Significance of ceruloplasmin, Serum ferritin, transferrin, TIBC.
6. Inborn errors of metabolism (e.g., phenylketonuria, maple syrup urine disease).
7. Pulmonary Function Tests:
    (a) Arterial blood gases interpretation in respiratory failure.
    (b) Advanced tests for diffusion capacity for carbon monoxide.
8. D-Dimer Test: Clinical significance of the D-Dimer test in diagnosing thrombosis-related conditions (e.g., deep vein thrombosis, pulmonary embolism).

MJ-10P: Clinical Biochemistry (Advanced) -Practical Credits 01

1. Insulin tolerance test.
2. TIBC, Ferritin, Transferrin
3. Cerruloplasmin
4. D-Dimer Test. Interpretation of D-Dimer results and their role in conditions such as disseminated intravascular coagulation (DIC).
5. Measurement of vitamin C, D, B12, folate in serum sample.

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MAJOR ELECTIVE (DSE)

Major Elective (MJ DSE) -1

(Forensic Diagnosis / Pharmacology and Toxicology)
Credits 04 (Full Marks: 75)

MJDSE-1T: Forensic Diagnosis (Theory)

Objective: To provide students with fundamental knowledge of medico-legal aspects, forensic pathology, toxicology, and scientific methods used in crime and death investigations.

Course Outcome: The broad goal of teaching Forensic Medicine is to produce a medical professional who is well informed about medico-legal responsibilities in the practice of medicine. He / She will be capable of making accurate observations and drawing logical conclusions to assist in the investigation of criminal cases and medico-legal issues. The student will acquire sound knowledge of the law as it relates to medical practice, medical negligence, and ethical conduct, enabling him/her to act responsibly and uphold professional integrity in all medico-legal situations.

Course contents:

1. Medico-legal aspects of a disease, Essential forensic pathology, and clinical forensic medicine to include recognition and interpretation of wounds and other injuries. Medical and scientific investigation of fires.
2. Explosions and similar causes of non-natural deaths, Child deaths and child abuse; Investigation of sexual offenses.
3. Principles of forensic toxicology, Drugs and poisons including drugs of abuse and the related law; Alcohol – scientific and legal aspects, Forensic DNA, Basics of Forensic Odontology.
4. Basics of forensic entomology. Insects of forensic importance. Collection of entomological evidence during death investigations.

OR

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MJ DSE-1T: Pharmacology and Toxicology (Theory)

Course Objective:
To understand how drugs act, how the body handles drugs, and the basic principles of toxicology.

Course Outcome:
The broad goal of teaching this course is to enable students to understand the fundamental principles of pharmacodynamics and pharmacokinetics. They will gain knowledge of drug-receptor interactions, mechanisms of drug action, and biotransformation processes. Students will also learn about toxins, dose–response relationships (LD_{50}, ED_{50}, NOEL), safety factors, and the factors affecting toxicity. This knowledge will help them interpret and evaluate pharmacotoxic effects for safe and effective drug use in clinical practice.

Course contents:

1. Pharmacodynamics & pharmacokinetics.
2. Bio-transformation of drug.
3. Drug receptor.
4. Concept of toxins & toxicology.
5. Basic idea about LD50, ED50, safety factor, NOEL.
6. Factor affecting toxicity of toxins.
7. Pharmacotoxicity.

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MINOR (MI)

MI – 5: Molecular Biology **Credits 04(FM: 75)**

Course Objective:
To introduce students to molecular biology concepts focusing on gene structure, function, regulation and their role in health and disease.

Course Outcome: Students will understand molecular diagnostics and gain practical skills in techniques, preparing them for careers in research or further studies.

MI – 5T: Molecular Biology **Credits 03**

Course contents:

1. Structure, function and types of DNA and RNA.
2. Central dogma of molecular biology (Replication, Transcription, Post-transcription modification, and Translation).
3. DNA Repair Mechanism and its types
4. Basics of Genetic code- Codon library, Wobble Phenomenon.
5. Types of mutations: point mutations, insertions, deletions.
6. Basic steps of DNA and RNA extraction methods: Cell lysis, removal of cellular components, removal of contaminants, and nucleic acid recovery.
7. Nucleic acid amplification and detection: Conventional PCR, qRT-PCR,
8. Agarose gel electrophoresis and gel documentation
9. Blotting techniques in clinical applications: Southern blot and Northern blot.

Suggested Readings:

1. Fundamental Molecular Biology, Lizabeth A. Allison, 1e (2007), Blackwell Publishing, ISBN-13-9781405103794.
2. Techniques in molecular biology, 1e (2008), Suraksha Agarwal, International Book Distributing Co., ISBN- 978811891518.

MI – 5P: Molecular Biology (Practical) **Credits 01**

Practical contents:

1. Collection and preparation of human blood, stool, rectal swabs (only for demonstration), Oral ((buccal cavity) nasopharyngeal swabs, urine, and fresh/frozen tissue samples (on conseting volunteers) for nucleic acid extraction.
2. Extraction of DNA and/or RNA from the specified samples in Sl. No. 1.
3. Demonstration on conventional PCR and qRT-PCR reaction set-up and thermal cycle condition.
4. Preparation of agarose gel for electrophoresis and detection of nucleic acids by UV-transilluminator/Gel-Doc.
5. Demonstration on Southern blot and Northern blot techniques.

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Suggested Readings:

1. Molecular biology techniques laboratory manual (2011), Shelley O' Grady, M.S., Linnea Fletcher, Patricia Phelps. Springer. ISBN-BITC2441F2011.
2. Techniques in molecular biology, 1e (2008), Suraksha Agarwal, International Book Distributing Co., ISBN- 978811891518.

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SEMESTER-VI

MAJOR (MJ)

MJ-11: Haematological and Histological slide analysis Credits 04(FM: 75)

Course Objective: The course objective of Haematological and Histological Slide Analysis is to equip students with the practical skills, theoretical knowledge, and analytical capabilities required to identify, interpret, and report on normal and pathological tissue samples and blood cells. This includes mastering microscopy, staining techniques, and understanding the morphological changes associated with various diseases, particularly in haematology and histopathology laboratories.
Course outcome:

After successful completion of this course, students will be able to:

i) Identify and describe the morphology of blood cells (RBCs, WBCs, platelets) in stained peripheral blood smears.
ii) Perform and interpret common haematological staining techniques such as Leishman stain, Wright stain, and Giemsa stain.
iii) Differentiate between normal and abnormal blood cell morphology and correlate findings with common haematological disorders (e.g., anemia, leukemia, infections).
iv) Prepare, stain, and examine histological tissue sections using standard techniques (e.g., Hematoxylin and Eosin staining).
v) Identify major tissue types (epithelial, connective, muscular, and nervous tissues) and recognize their microscopic structures.
vi) Analyze histopathological changes in tissues and relate them to disease conditions.
vii) Operate and maintain light microscopes and demonstrate proper slide handling and observation techniques.
viii) Document and report microscopic findings accurately using appropriate scientific terminology.

MJ-11T: Haematological and Histological slide analysis Credits 03

Course content:

Haematological slide analysis

1. Diagnosis of anaemia, Detection of infections (e.g., malaria, Leishmania), Leukaemia screening from peripheral blood smear.
2. Size, shape, colour, Central pallor, Normal appearance, identifying features and distribution in smear of RBC, WBC, Platelet.
3. Abnormal Morphology and significance of:
   RBC- Anisocytosis (size variation) Poikilocytosis (shape variation), Microcytic hypochromic, Macrocytic, Sickle cells, Target cells, Tear drop cell, Spherocytes, Ovalocytes, Burr cell, Howell – Jolly body, Basophilic stippling, Cabots ring, Schistocytes, Acanthocytes, Pappenheimer bodies, Crystal formation, Heinz body, Bite cells, blister cells.

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WBC - abnormal morphology, Leucocytosis & Leukopenia, Blast cells (basic idea of leukemia), Toxic granulation, Döhle bodies, vacuolation, hyper segmented neutrophils, atypical lymphocytes. **Platelet** - Thrombocytopenia, Thrombocytosis, Giant platelets, platelet clumps/ satellitism, agranular platelets, Correlation with bleeding disorders.

4. Integration of smear findings with patient history and other lab tests.

Histological slide analysis:

5. Semi-Quantitative (Ordinal) Scoring Systems: Assign grades based on severity or extent of lesions and its Applications in the detection of Inflammation, Necrosis, Fibrosis
6. Quantitative Morphometric Analysis: Objective measurement using image analysis. Cell count per unit area, Area fraction (%) of fibrosis or tumor, Thickness of tissue layers. Use of ImageJ and QuPath tools.
7. Histological Activity Index (HAI) used in specific diseases. Chronic Hepatitis. Immunohistochemical (IHC) Scoring Systems: Common Methods e.g. H-Score (Histoscore) Combines intensity + % of positive cells.
8. Composite Scoring Systems: Combine multiple histological features. Nonalcoholic Fatty Liver Disease Activity Score (NAS), Includes steatosis, ballooning, inflammation
9. Binary Scoring: Presence or absence of tumor positive/negative staining

MJ-11P: Haematological and Histological slide analysis Credits 01

Practical contents:

1. Identification of normal and abnormal RBCs, WBC types, and platelets,
2. Identification of malarial parasites on smear (Ring form and gametocytes)
3. Identification of organ in different pathological conditions: Liver, Kidney, Gall bladder, Ovary, Testis, Pancreas.
4. Characteristics of different types of cancer cells/tissue and inflammation.

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MJ-12: Computer application in Health Informatics Credits 04(FM: 75)

Course Objective:
To provide students with knowledge of computer applications and health informatics, focusing on data management and technology use in healthcare.

Course outcome: Students will effectively analyze health data using statistical software, create meaningful visualizations, and apply ethical principles in health information management to improve patient outcomes and healthcare delivery.

MJ-12T: Computer application in Health Informatics Credits 03

Course content:

1. Digital Computer Applications in Patient Maintenance: management of patient data using digital tools.
2. Basic knowledge of MS Office for document creation, data analysis, and presentations.
3. Definition, scope, and importance of health informatics. Role of informatics in healthcare delivery and patient safety.
4. Overview of AI: history, definitions, and concepts, applications of AI in healthcare sector.
5. Components and uses of Health Information Systems (HIS). Types of health information systems (EHR, HIS, LIS, etc.). Data flow and integration within health systems.
6. **Electronic Health Records (EHR):** Structure and functionality of EHRs. Benefits and challenges of EHR implementation. Data privacy, security, and regulatory compliance.

MJ-12P: Computer application and Health Informatics (Practical) Credits 01

Practical contents:

1. Data Entry and Management in Pathological Labs
2. Data Analysis and Visualization: using statistical software (Excel, Graphpad prism) for analyzing sample health data, generating visualizations (charts, graphs) and interpretation of results.
3. Case Studies on Health Informatics.

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MJ-13: Assisted Reproductive Technology and Embryology Credits 04(FM: 75)

Course Objective: To provide students with knowledge and skills in assisted reproductive technology and embryology, focusing on techniques for fertility treatment and reproductive health.

Course outcome: Students will gain comprehensive knowledge of assisted reproductive technologies and embryology, acquire practical skills in laboratory techniques, and understand the ethical considerations in reproductive medicine, preparing them for careers in reproductive health and related fields.

MJ-13T: Assisted Reproductive Technology Credits 03

Course content:

1. Anatomy and physiology of the male and female reproductive systems. Gametogenesis: Spermatogenesis and oogenesis.
2. Infertility and reproductive disorders.
3. Definition and history of Assisted Reproductive Technology (ART). Overview of ART techniques: IVF, ICSI, IUI, and cryopreservation
4. Ethical issues surrounding ART: Consent, donor anonymity, and genetic selection.
5. Quality control and management in ART laboratories.

MJ-13P: Assisted Reproductive Technology and Embryology (Practical) Credits 01

1. Hormononal assessment using ELISA technique (Estrogen, Progesterone, Testosterone, LH, FSH, Insulin).
2. Demonstration of Oocyte handling, and embryo culture in IVF laboratory.
3. Acrosomal testing of sperm; sperm motility and viability.
4. Pregnancy test by ELISA.

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MAJOR ELECTIVE (DSE)

Major Elective (MJ DSE) -2
(Oncopathology / Cellular and System pathology)
Credits 04 (Full Marks: 75)

MJ DSE-2T: Oncopathology and Cellular and System pathology (Theory)

Objective: To teach students the principles of oncopathology and systemic pathology, focusing on cancer diagnosis, cellular alterations and disease mechanisms.

Course Outcome: The course enables students to understand the pathology of cancers and systemic diseases, focusing on their diagnosis, progression, and treatment methods.

Course contents:

1. Benign and malignant tumors. Tumor nomenclature and classification. Mechanisms of carcinogenesis (genetic, chemical, viral).
2. Oncogenes and tumor suppressor genes. Apoptosis and cancer progression.
3. Different types of cancer. Rare types of cancer. Metastasis and invasion pathways.
4. Molecular markers and their role in cancer.
5. Techniques for cancer diagnosis (Principles). Cytology and histopathological techniques of cancer detection. Immunohistochemistry.
6. Reversible and irreversible cell injury. Necrosis.
7. Acute and chronic inflammation in Cancer.

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MJ DSE-2T: Cellular and System pathology (Theory)

1. **Cardiovascular Pathology**
   a) Rheumatic fever and Rheumatic Heart Disease: Pathogenesis and diagnosis. b) Atherosclerosis, Ischemic Heart Disease and Myocardial Infarction: Pathogenesis and diagnosis. c) Cardiomyopathy: Pathogenesis and diagnosis.

2. **Respiratory Pathology**
   a) Emphysema: Types, pathogenesis and diagnosis. b) Occupational lung disorders: anthracosis, silicosis, asbestosis, mesothelioma: pathogenesis and diagnosis. c) Pulmonary Tuberculosis : Primary and Secondary: pathogenesis and diagnosis.

3. **Gastro-Intestinal Tract Pathology**
   a) Hemolytic Anaemias : Classification, pathogenesis and diagnosis. b) Thalassemia, sickle cell anaemia: pathogenesis and diagnosis.

4. **Urinary Tract Pathology**
   a) Glomerulonephritis: Classification, pathogenesis and diagnosis. b) Urolithiasis: pathogenesis and diagnosis.

5. **Hepatic Pathology**
   a) Jaundice: Types, Pathogenesis and Diagnosis. b) Hepatitis: types, Pathogenesis and diagnosis. c) Cirrhosis: Pathogenesis and diagnosis.

6. **Endocrine Pathology**
   a) Diabetes Mellitus : Types, Pathogenesis and diagnosis b) Adrenal diseases : Pathogenesis and diagnosis

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MINOR (MI)

MI – 6: Clinical Haematology **Credits 04(FM: 75)**

Course objective:
To teach students about blood disorders, focusing on diagnosis and treatment of hematological conditions.

Course outcome: This course enables students to develop the skills to diagnose and analyze blood disorders through comprehensive knowledge of hematological tests and techniques.

MI – 6T: Clinical Haematology (Theory) **Credits 03**

Course contents:

1. Different blood cells morphology in pathological condition.
2. Red cell indices in pathological conditions.
3. G6PD deficiency anemia, pyruvate kinase deficiency anemia, PNH, Hemosiderosis, Aplastic anemia, Pernicious anemia, Megaloblastic anemia, Auto-immune hemolytic anemia.
4. Genetically transmitted hemolytic disorders and its detection – Sickle cell anemia, Thalassemia.
5. Hemato-oncology
6. Coagulation disorders and its detection.
7. Leukemia and its types. Lymphoma, Bone marrow biopsy

MI – 6P: Clinical Haematology (Practical) **Credits 01**

1. Preparation of different types of blood smear. Complete blood count (CBC) and differential counts
2. Different types of leukemia – preparation of slides from suspected blood samples and identification.
3. Demonstration of Hemoglobin variants by HPLC method.
4. Biochemical method for sickle cell anemia detection.
5. Identification of different cellular characteristic features in blood smear of sickle cell anemia and thalassemia patients.

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