

SANKALCHAND PATEL UNIVERSITY

FACULTY OF MEDICINE BACHELOR OF MEDICINE AND BACHELOR OF SURGERY (M.B.B.S.)



PATHOLOGY

CURRICULUM / SYLLABUS & ASSESSMENT

Applicable for batch admitted in M.B.B.S. course from academic year 2024-25

(AS PER COMPETENCY BASED UNDERGRADUATE CURRICULUM
FOR THE INDIAN MEDICAL GRADUATE 2024)

Teaching & Evaluation Scheme for Faculty of Medicine

Semester/Year: Second Year M.B.B.S.

Program Name: Bachelor of Medicine and Bachelor of Surgery

Effective from Academic Year: 2024-25

Program Code: MB01

Course Code	Subject Name	Hrs/Week			UA		IA		Total	
		L	P	Total	Max	Min	Max	Min	Max	Min
2PA201	Pathology-I	3	-	3	100	80	-	-	200	150
2PA202	Pathology-II	2	-	2	100		-	-		
2PA203	Pathology Practical	-	4	4	100	40	-	-	100	
2PA204	Pathology IA Theory	-	-	-	-	-	100	40	200	100
2PA205	Pathology IA Practical	-	-	-	-	-	100	40		

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PATHOLOGY

COURSE CONTENT

PREAMBLE

- Pathology bridges the gap between basic sciences and clinical medicine, so a proper understanding of pathological processes is crucial for medical practice. The main goals of undergraduate pathology teaching have always been to provide a language or framework for the description of disease and to provide students with knowledge of the functional and structural changes in disease so that clinical signs and symptoms can be understood and interpreted. The understanding of the pathological basis of disease is so vital for practice of medicine that its teaching needs to be integrated throughout the medical course. The new Graduate Medical Education Regulations provides for an outcome driven undergraduate curriculum, to provide the orientation and the skills necessary for life-long learning, to enable proper care of the patient. The undergraduate medical curriculum has thus evolved from being teacher-centered to student centered, from discipline-based to integrated core and options-based and from passive acquisition of knowledge imparted by teachers to active problem-based learning. Skill acquisition is an indispensable component of the learning process in modern medicine. However, the need for development of professional attitude, behavior and communication skills befitting a medical practitioner is well perceived and emphasized by the new curriculum with incorporation of AETCOM sessions. Pathology teaching is perceived as fact-based, but the present curriculum will evolve pathology into clinical oriented specialty. The key elements of the curriculum such as integrating basic science with clinical oriented learning, direct faculty feedback, interactive with experiential learning and competency-based student assessments will bring in remarkable changes in pathology teaching. These changes will provide the Indian Medical Graduate a strong foundation in the pathophysiological basis of disease which is critical to the formation of a competent clinician.

Department of Pathology

GOAL AND OBJECTIVES

- **GOAL:**

The broad goal of the teaching of undergraduate student in Pathology is to provide the students with a comprehensive knowledge of the mechanisms and causes of disease, in order to enable him/her to achieve complete understanding of the natural history and clinical manifestations of disease.

- **OBJECTIVES:**

A. KNOWLEDGE:

At the end of the course, the student shall be able to:

1. Describe the structure and ultra structure of a sick cell, mechanisms of cell degeneration, cell death and repair and be able to correlate structure and functional alterations.
2. Explain the patho physiological process which govern the maintenance of homeostasis, mechanisms of their disturbance and the morphological and clinical manifestations associated with it;
3. Describe the mechanisms and patterns to tissue response to injury such that he/she can appreciate the pathophysiology of disease processes and their clinical manifestations;
4. Correlate normal and altered morphology (Gross and Microscopic) of different organ systems in common disease to the extent needed for understanding of disease processes and their clinical significance.

B. SKILLS:

At the end of the course, the student shall be able to:

1. Describe the rationale and principles of technical procedures of the diagnostic laboratory tests and interpretation of the results;
2. Perform the simple bed-side tests on blood, urine and other biological fluid samples;
3. Draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders;

C. INTEGRATION:

At the end of the course, the candidate should be able to integrate his knowledge and skill in important clinical conditions and utilize it efficiently in arriving at diagnosis for optimum management and preventive measures.

D. CURRICULUM:

As per competency based medical education curriculum for the Indian medical graduate-2024, national medical commission.

TERMS AND TEACHING GUIDELINES

1. LECTURE: A teaching learning method which includes traditional and interactive sessions involving a large group.
2. SMALL GROUP DISCUSSION: An instructional method involving small groups of students in an appropriate learning context.
3. DOAP (Demonstration- Observation - Assistance - Performance): A practical session that allows the student to observe demonstration, assists the performer, perform in a simulated environment, perform under supervision or perform independently.
4. SELF DIRECTED LEARNING: A process in which individuals take the initiative, with or without the help of others in diagnosing their learning needs, formulating learning goals, identifying human and material sources for learning, choosing and implementing appropriate learning methods.
5. SKILL ASSESSMENT: A session that assesses the skill of the student including those in the practical laboratory, skills lab, skills station that uses mannequins/ paper case/simulated patients/real patients as the context demands.
6. CORE: A competency that is necessary in order to complete the requirements of the subject (traditional must know)
7. NON – CORE: A competency that is optional in order to complete the requirements of the subject (traditional nice (good) to know/ desirable to know)

Summary of Time Allotted, Teaching and Learning Methods
(Distribution of Subject-Pathology Teaching Hours for Phase-2 MBBS)

Curricular component	Time allotted in hours
Large group teaching	80
SGT/Practicals/Tutorials/Seminars	170
SDL	10
AETCOM	02
Total	262

SGT: Small group teaching SDL: Self-directed learning

To be noted:

- It is recommended that didactic teaching be restricted to less than one third of the total time allotted for that discipline.
- Greater emphasis is to be laid on hands-on training, symposia, seminars, small group discussions, problem-oriented and problem-based discussions and self- directed learning.
- Students must show courage to take active part in and shared responsibility for their learning.

PATHOLOGY SYLLABUS

(WITH NMC COMPETENCY NUMBER, AS PER

COMPETENCY BASED MEDICAL EDUCATION (CBME) CURRICULUM

FOR THE INDIAN MEDICAL GRADUATE-2024, NATIONAL MEDICAL COMMISSION)

PATHOLOGY (Topics = 35, Competencies = 182)

NMC competency number	COMPETENCY TOPIC	Teaching Learning method (*Practical - DOAP & DEMO)	Number required to certify
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Topic 1: Introduction to Pathology Number of competencies: (3)

Number of competencies that require certification: (NIL)

PA1.1	Describe the role of a pathologist in diagnosis and management of disease	LGT	
PA1.2	Enumerate common definitions and terms used in Pathology and Describe the history and evolution of Pathology	LGT, SGT	
PA1.3	Describe proliferation and cell cycle and concept of regenerative medicine along with role of stem cells.	LGT, SGT	

Topic 2: Cell Injury and Adaptation Number of competencies: (08)

Number of competencies that require certification: (NIL)

PA2.1	Describe the causes, mechanisms, types and effects of cell injury and their clinical significance	LGT, SGT	
PA2.2	Describe the etiology of cell injury. Distinguish between reversible- irreversible injury: mechanisms; morphology of cell injury	LGT, SGT	
PA2.3	Describe morphological changes in intracellular accumulation of fats, proteins, carbohydrates, pigments	LGT, SGT	
PA2.4	Describe and explain Cell death- types, mechanisms, necrosis, apoptosis (basic as contrasted with necrosis), autolysis	LGT, SGT	
PA2.5	Describe types and pathology of calcifications and gangrene	LGT, SGT	
PA2.6	Describe cellular adaptations: atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia and carcinoma in situ	LGT, SGT	
PA2.7	Describe the mechanisms of cellular aging and apoptosis	LGT, SGT	
PA2.8	Identify and describe various forms of cell injuries with their manifestations and consequences in gross and	DOAP	

	microscopic specimens		
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Topic: 3 Inflammation Number of competencies:(04)

Number of competencies that require certification: (NIL)

PA3.1	Define and describe the general features of acute and chronic inflammation including stimuli, vascular and cellular events	LGT, SGT	
PA3.2	Enumerate and describe the mediators of acute inflammation	LGT, SGT	
PA3.3	Define and describe chronic inflammation including causes, types non- specific and granulomatous and enumerate examples of each	LGT, SGT	
PA3.4	Identify and describe acute and chronic inflammation in gross and microscopic specimens	DOAP	

Topic 4: Healing and repair Number of competencies: (01)

Number of competencies that require certification:(NIL)

PA4.1	Define and describe the process of repair and regeneration including wound healing and its types	LGT, SGT	
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Topic 5: Hemodynamic disorders Number of competencies: (06)

Number of competencies that require certification :(NIL)

PA5.1	Define and describe Ischemia/infarction, embolism its types, etiology, morphologic changes and clinical effects	LGT, SGT	
PA5.2	Define and describe hyperemia, congestion, hemorrhage	LGT, SGT	
PA5.3	Define and describe shock, its pathogenesis and its stage	LGT, SGT	
PA5.4	Define and describe normal haemostasis and the etiopathogenesis and consequences of thrombosis	LGT, SGT	
PA5.5	Define and describe Ischemia/infarction, embolism its types, etiology, morphologic changes and clinical effects	LGT, SGT	
PA5.6	Identify and describe the gross and microscopic features of infarction in a pathologic specimen	DOAP	

Topic 6: Neoplastic disorders Number of competencies: (07)

Number of competencies that require certification: (NIL)

PA6.1	Define and classify neoplasia. Describe the characteristics of neoplasia including gross, microscopy, biological behavior and spread. Differentiate between benign from malignant neoplasms	LGT, SGT	
PA6.2	Describe the molecular basis of cancer, role of genetic and epigenetic alterations with special emphasis on common cancers like breast/ colon	LGT, SGT	
PA6.3	Define and classify the carcinogens and describe the process of different types of carcinogenesis	LGT, SGT	
PA6.4	Describe the effects of tumor on the host including para neoplastic syndrome	LGT, SGT	
PA6.5	Describe laboratory diagnosis of cancer including molecular profiles of tumors, tumors markers and future of cancer diagnostics	LGT, SGT	
PA6.6	Describe immunology and the immune response to cancer with its clinical significance – Immunotherapy	LGT, SGT	
PA6.7	Identify and describe the gross and microscopic features of Benign and malignant neoplasm in a pathologic specimen	DOAP	

Topic 7: Basic diagnostic cytology Number of competencies:(01)

Number of competencies that require certification:(NIL)

PA7.1	Describe the techniques of cytology, staining & diagnostic role of cytology and its application in clinical care	LGT, SGT	
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Topic 8: Immunopathology and AIDS Number of competencies: (06)

Number of competencies that require certification: (NIL)

PA8.1	Describe the principles and mechanisms involved in immunity	LGT, SGT	
PA8.2	Describe the mechanism of hypersensitivity reaction	LGT, SGT	
PA8.3	Describe the HLA system and the immune principles involved in transplant and mechanism of transplant rejection	LGT, SGT	
PA8.4	Define autoimmunity. Enumerate autoimmune disorder and describe the pathogenesis of common autoimmune diseases	LGT, SGT	
PA8.5	Define and describe the pathogenesis of systemic Lupus Erythematosus	LGT, SGT	

PA8.6	Define and describe the pathogenesis and pathology of HIV and AIDS	LGT, SGT	
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Topic 9: Amyloidosis Number of competencies: (02)
Number of competencies that require certification:(NIL)

PA9.1	Describe the pathogenesis and pathology of amyloidosis	LGT, SGT	
PA9.2	Identify and describe various forms of amyloidosis with their manifestations and consequences in gross and microscopic specimens	DOAP	

Topic 10: Infections and Infestations Number of competencies: (05)
Number of competencies that require certification:(NIL)

PA10.1	Define and describe the pathogenesis and pathology of malaria	LGT, SGT	
PA10.2	Define and describe the pathogenesis and pathology of cysticercosis	LGT, SGT	
PA10.3	Define and describe the pathogenesis and pathology of leprosy	LGT, SGT	
PA10.4	Define and describe the pathogenesis and pathology of common bacterial, viral, protozoal and helminthic diseases	LGT, SGT	
PA10.5	Define and describe the pathogenesis and pathology and laboratory findings in COVID	LGT, SGT	

Topic 11: Genetic and pediatric diseases Number of competencies: (03)
Number of competencies that require certification :(NIL)

PA11.1	Describe the pathogenesis and features of common cytogenetic abnormalities and mutations in with diagnostic modalities in childhood	LGT, SGT	
PA11.2	Describe the pathogenesis and pathology of tumor and tumor like conditions in infancy and childhood	LGT, SGT	
PA11.3	Describe the pathogenesis of common storage disorders in infancy and childhood	LGT, SGT	

Topic 12: Environmental and nutritional diseases Number of competencies:(03)
Number of competencies that require certification:(NIL)

PA12.1	Enumerate and describe the pathogenesis of disorders caused by air pollution, tobacco, alcohol and noise	LGT, SGT	
PA12.2	Describe the pathogenesis of disorders caused by protein calorie malnutrition, vitamins and starvation	LGT, SGT	
PA12.3	Describe the pathogenesis of obesity and its consequences	LGT, SGT	

	with special emphasis on metabolic syndrome		
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Topic 13: Introduction to hematology Number of competencies: (04)

Number of competencies that require certification:(1)

PA13.1	Describe hematopoiesis and extra medullary hematopoiesis and the role of anticoagulants in hematology	LGT, SGT	
PA13.2	Define and classify anemia Enumerate and describe the investigation of anemia	LGT, SGT	
PA13.3	Describe collection of specimens and identify coagulants and anticoagulant bulbs, instruments	DEMO	
PA13.4	Perform common haematological tests – Hb, RBC count, WBC count and DLC	DEMO	4

Topic 14: Microcytic anemia Number of competencies: (02)

Number of competencies that require certification:(1)

PA14.1	Describe iron metabolism and describe the etiology, investigations and differential diagnosis of microcytic hypochromic anemia	LGT, SGT	
PA14.2	Identify and describe the peripheral smear in microcytic Anemia	DEMO	1

Topic 15: Macrocytic anemia Number of competencies: (03)

Number of competencies that require certification: (1)

PA15.1	Describe the metabolism of Vitamin B12 and the etiology and pathogenesis of B12 deficiency and describe laboratory investigations of macrocytic anemia	LGT, SGT	
PA15.2	Enumerate the differences and describe the etiology, laboratory features of megaloblastic anemia and distinguishing features of megaloblastic and non-megaloblastic macrocytic anemia	LGT, SGT	
PA15.3	Identify and describe the peripheral blood picture of macrocytic Anemia	DEMO	1

Topic 16: Hemolytic anemia Number of competencies: (03)

Number of competencies that require certification: (01)

PA16.1	Define and classify hemolytic anemia and describe the pathogenesis and clinical features and hematologic indices of hemolytic anemia	LGT, SGT	
PA16.2	Describe the pathogenesis, features, hematologic indices and peripheral blood picture of sickle cell anemia and thalassemia	Lecture, Small group discussion	1
PA16.3	Describe the etiology, pathogenesis, hematologic indices and peripheral blood picture of Acquired hemolytic anemia and different hemolytic Anemias	Lecture, Small group discussion	

Topic 17: Aplastic anemia Number of competencies: (01)

Number of competencies that require certification:(NIL)

PA 17.1	Describe the etiology, pathogenesis and findings in aplastic Anemia and Enumerate the indications and describe the findings in bone marrow aspiration and biopsy	LGT, SGT	
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Topic 18: Leukocyte disorders Number of competencies: (02)

Number of competencies that require certification:(NIL)

PA18.1	Enumerate and describe the causes of leukocytosis leucopenia lymphocytosis and leukemoid reactions	LGT, SGT	
PA 18.2	Describe the etiology, genetics, pathogenesis classification, features, hematologic features of acute and chronic leukemia	LGT, SGT	

Topic 19: Lymph node and spleen Number of competencies: (06)

Number of competencies that require certification:(NIL)

PA19.1	Enumerate the causes and describe the differentiating features of lymphadenopathy	LGT, SGT	
PA19.2	Describe the pathogenesis and pathology of tuberculous Lymphadenitis	LGT, SGT	
PA19.3	Describe and discuss the pathogenesis, pathology and the differentiating features of Hodgkin's and non-Hodgkin's lymphoma	DOAP	
PA19.4	Enumerate and differentiate the causes of splenomegaly	LGT, SGT	
PA19.5	Identify and describe the features of tuberculous lymphadenitis in a gross and microscopic specimen	DOAP	

PA19.6	Identify and describe the features of Hodgkin's lymphoma in a gross and microscopic specimen	DOAP	
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Topic 20: Hemorrhagic disorders Number of competencies: (03)

Number of competencies that require certification:(NIL)

PA20.1	Describe normal hemostasis Classify and describe the etiology, pathogenesis and pathology of vascular and platelet disorders including ITP and hemophilias	LGT, SGT	
PA20.2	Define and describe disseminated intravascular coagulation, its laboratory findings and diagnosis of disseminated intravascular coagulation and diagnosis of Vitamin K deficiency	LGT, SGT	
PA20.3	Define and describe its laboratory findings and diagnosis of Multiple Myeloma	LGT, SGT	

Topic 21: Blood banking and transfusion Number of competencies: (06)

Number of competencies that require certification: (1)

PA21.1	Classify and describe blood group systems (ABO and RH)	LGT, SGT	
PA21.2	Enumerate blood components and describe their clinical uses	LGT, SGT	
PA21.3	Enumerate and describe infections transmitted by blood transfusion	LGT, SGT	
PA21.4	Describe transfusion reactions and enumerate the steps in investigation of a transfusion reaction.	LGT, SGT	
PA21.5	Enumerate the indications and describe the principles and procedure of autologous transfusion	LGT, SGT	
PA21.6	Describe the correct technique to perform blood grouping. Describe the correct technique to perform a cross match	DEMO	1

Topic 22: Clinical Pathology Number of competencies: (05)

Number of competencies that require certification: (2)

PA22.1	Describe abnormal urinary findings in disease states and identify and describe common urinary abnormalities in a clinical specimen	DOAP	
PA22.2	Describe abnormal findings in body fluids in various disease states	LGT, SGT	
PA22.3	Describe and interpret the abnormalities in a panel containing semen analysis, thyroid function tests.	DOAP	
PA22.4	Describe and interpret the abnormalities in a panel containing liver function tests	LGT/DOAP	4

PA22.5	Describe and interpret the abnormalities in a panel containing, renal function tests	LGT/DOAP	4
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Topic 23: Gastrointestinal tract Number of competencies: (09)
Number of competencies that require certification: (NIL)

PA23.1	Describe the etiology, pathogenesis, pathology and clinical features of oral cancers	LGT, SGT	
PA23.2	Describe the etiology, pathogenesis, pathology, microbiology, clinical and microscopic features of carcinoma esophagus	LGT, SGT	
PA23.3	Describe the etiology, pathogenesis, pathology, microbiology, clinical and microscopic features of peptic ulcer disease	LGT, SGT	
PA23.4	Describe and etiology and pathogenesis and pathologic features of carcinoma of the stomach	LGT, SGT	
PA23.5	Describe and etiology and pathogenesis and pathologic features of Tuberculosis of the intestine and appendicitis.	LGT, SGT	
PA23.6	Describe and etiology and pathogenesis and pathologic and distinguishing features of Inflammatory bowel disease	LGT, SGT	
PA23.7	Enumerate causes and describe laboratory diagnosis of malabsorption syndrome	LGT, SGT	
PA23.8	Describe the etiology, pathogenesis, pathology and distinguishing features of carcinoma of the colon	LGT, SGT	
PA23.9	Describe and identify the microscopic features of peptic ulcer, intestinal ulcers and tumours of GIT	DOAP	

Topic 24: Hepatobiliary system Number of competencies: (09)

Number of competencies that require certification: (01)

PA24.1	Describe Bilirubin metabolism, enumerate the etiology and pathogenesis of jaundice, distinguish between direct and indirect hyper Bilirubinemia	LGT, SGT	
PA24.2	Describe the pathophysiology and pathologic changes seen in hepatic failure and their clinical manifestations, complications and consequences	LGT, SGT	
PA24.3	Describe the etiology and pathogenesis of viral and toxic hepatitis: distinguish the causes of hepatitis based on the clinical and laboratory features. Describe the pathology, complications and consequences of hepatitis	LGT, SGT	
PA24.4	Describe the pathophysiology, pathology and progression of alcoholic liver disease including cirrhosis	LGT, SGT	
PA24.5	Describe the etiology, pathogenesis and complications of portal hypertension	LGT, SGT	
PA24.6	Interpret liver function and viral hepatitis serology panel. Distinguish obstructive from non-obstructive jaundice based on clinical features and liver function tests	DOAP	1
PA24.7	Define and describe the etiology, types, pathogenesis, morphology and complications of Hepatocellular Carcinoma	LGT, SGT	
PA24.8	Describe the pathophysiology, pathology and complications of acute cholecystitis and Cholelithiasis	LGT, SGT	
PA24.9	Describe and identify the microscopic features of liver diseases and tumors	DOAP	

Topic 25: Respiratory system Number of competencies: (07)

Number of competencies that require certification: (NIL)

PA25.1	Define and describe the etiology, types, pathogenesis, stages, morphology and complications of pneumonia	LGT, SGT	
PA25.2	Describe the etiology, gross and microscopic appearance and complications of lung abscess	LGT, SGT	
PA25.3	Define and describe the etiology, types, pathogenesis, stages morphology and complications and evaluation of Obstructive airway disease (OAD) and bronchiectasis	LGT, SGT	
PA25.4	Define and describe the etiology, types, pathogenesis, stages, morphology microscopic appearance and complications of tuberculosis	LGT, SGT	
PA25.5	Define and describe the etiology, types, exposure, environmental influence, pathogenesis, stages, morphology, microscopic appearance and complications of Occupational lung disease	LGT, SGT	
PA25.6	Define and describe the etiology, types, exposure, genetic environmental influence, pathogenesis, stages, morphology, microscopic appearance, metastases and complications of tumors of the lung and pleura including mesothelioma	LGT, SGT	
PA25.7	Identify and describe the features of diseases and tumors of lung in a gross and microscopic specimen	DOAP	

Topic 26: Cardiovascular system Number of competencies: (10)

Number of competencies that require certification: (NIL)

PA26.1	Distinguish arteriosclerosis from atherosclerosis. Describe the pathogenesis and pathology of various causes and types of atherosclerosis	LGT, SGT	
PA26.2	Describe the etiology, dynamics, pathology types and complications of aneurysms including aortic aneurysms	LGT, SGT	
PA26.3	Describe the etiology, types, stages pathophysiology, pathology and complications of heart failure	LGT, SGT	
PA26.4	Describe the etiology, pathophysiology, pathology, gross and, complications of congenital heart disease	LGT, SGT	
PA26.5	Describe the etiology, pathophysiology, pathology, gross and microscopic features, criteria and complications of rheumatic fever	LGT, SGT	
PA26.6	Describe the epidemiology, risk factors, etiology, pathophysiology, pathology, presentations, gross and microscopic features, diagnostic tests and complications of ischemic heart disease and Interpret abnormalities in cardiac function testing in acute coronary syndromes	LGT, SGT	
PA26.7	Describe the etiology, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of infective endocarditis	LGT, SGT	
PA26.8	Describe the etiology, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of pericarditis and pericardial effusion	DOAP	
PA26.9	Classify and describe the etiology, types, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of cardiomyopathies	LGT, SGT	
PA26.10	Describe the etiology, pathophysiology, pathology features and complications of tumors of cardiovascular system.	LGT, SGT	

Topic 27: Urinary Tract Number of competencies: (17)

Number of competencies that require certification: (NIL)

PA27.1	Describe the normal histology of the kidney	LGT, SGT	
PA27.2	Define, classify and distinguish the clinical syndromes and describe the etiology, pathogenesis, pathology, morphology, clinical and laboratory and urinary findings, complications of renal failure	LGT, SGT	
PA27.3	Define and describe the etiology, precipitating factors, pathogenesis, pathology, laboratory urinary findings, progression and complications of acute renal failure	LGT, SGT	
PA27.4	Define and describe the etiology, precipitating factors, pathogenesis, pathology, laboratory urinary findings progression and complications of chronic renal failure	LGT, SGT	
PA27.5	Define and classify glomerular diseases. Enumerate and describe the etiology, pathogenesis, mechanisms of glomerular injury, pathology, distinguishing features and clinical manifestations of glomerulonephritis	LGT, SGT	
PA27.6	Define and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, progression and complications of IgA nephropathy	LGT, SGT	
PA27.7	Enumerate and describe the findings in glomerular manifestations of systemic disease	LGT, SGT	
PA27.8	Enumerate and classify diseases affecting the tubular Interstitium	LGT, SGT	
PA27.9	Define and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, progression and complications of acute tubular necrosis	LGT, SGT	
PA27.10	Describe the etiology, pathogenesis, pathology, laboratory findings, distinguishing features progression and complications of acute and chronic pyelonephritis and reflux nephropathy	LGT, SGT	
PA27.11	Define classify and describe the etiology, pathogenesis pathology, laboratory, urinary findings, distinguishing features progression and complications of vascular disease of the kidney	LGT, SGT	

PA27.12	Define classify and describe the genetics, inheritance, etiology, pathogenesis, pathology, laboratory, urinary findings, distinguishing features, progression and complications of cystic disease of the kidney	LGT, SGT	
PA27.13	Define classify and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, distinguishing features progression and complications of renal stone disease and obstructive uropathy	LGT, SGT	
PA27.14	Classify and describe the etiology, genetics, pathogenesis, pathology, presenting features, progression and spread of renal tumors	LGT, SGT	
PA27.15	Describe the etiology, genetics, pathogenesis, pathology, presenting features and progression of thrombotic angiopathies	LGT, SGT	
PA27.16	Describe the etiology, genetics, pathogenesis, pathology, presenting features and progression of urothelial tumors	LGT, SGT	
PA27.17	Identify and describe the features of kidney diseases and tumors in a gross and microscopic specimen	DEMO	

Topic 28: Male Genital Tract Number of competencies: (06)

Number of competencies that require certification: (NIL)

PA28.1	Classify testicular tumors and describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of testicular tumors	LGT, SGT	
PA28.2	Describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the penis	LGT, SGT	
PA28.3	Describe the pathogenesis, pathology, hormonal dependency presenting and distinguishing features, urologic findings & diagnostic tests of benign prostatic hyperplasia	LGT, SGT	
PA28.4	Describe the pathogenesis, pathology, hormonal dependency presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the prostate	LGT, SGT	
PA28.5	Describe the etiology, pathogenesis, pathology and progression of prostatitis	LGT, SGT	
PA28.6	Describe and identify the morphologic and microscopic features of diseases and tumors of male genital tract	DOAP	

Topic 29: Female Genital Tract Number of competencies: (10)

Number of competencies that require certification: (NIL)

PA.29.1	Describe the epidemiology, pathogenesis, etiology, pathology, screening, diagnosis and progression of carcinoma of the cervix	LGT, SGT	
PA29.2	Describe the pathogenesis, etiology, pathology, diagnosis and progression and spread of carcinoma of the endometrium	LGT, SGT	
PA29.3	Describe the pathogenesis, etiology, pathology, diagnosis and progression and spread of carcinoma of the leiomyoma and leiomyosarcomas	LGT, SGT	
PA29.4	Classify and describe the etiology, pathogenesis, pathology, morphology, clinical course, spread and complications of ovarian tumors	LGT, SGT	
PA29.5	Describe the etiology, pathogenesis, pathology, morphology, clinical course, spread and complications of gestational trophoblastic neoplasms	LGT, SGT	
PA29.6	Describe the etiology and morphologic features of cervicitis	LGT, SGT	
PA29.7	Describe the etiology, hormonal dependence, features and morphology of endometriosis	LGT, SGT	
PA29.8	Describe the etiology and morphologic features of adenomyosis	LGT, SGT	
PA29.9	Describe the etiology, hormonal dependence and morphology of endometrial hyperplasia	LGT, SGT	
PA29.10	Describe and identify the morphologic and microscopic features of diseases and tumors of female genital tract	DOAP	

Topic 30: Breast Number of competencies: (05)

Number of competencies that require certification: (NIL)

PA30.1	Classify and describe the types, etiology, pathogenesis, hormonal dependency of breast pathology and benign disease	LGT, SGT	
PA30.2	Classify and describe the epidemiology, pathogenesis, classification, morphologic and microscopic features, prognostic factors, hormonal dependency, staging and spread of carcinoma of the breast	LGT, SGT	
PA30.3	Describe and identify the morphologic and microscopic features of Phyllodes tumor of the breast	DOAP	
PA30.4	Enumerate and describe the etiology, hormonal dependency and pathogenesis of Gynaecomastia	LGT, SGT	
PA30.5	Describe and identify the morphologic and microscopic features of benign and malignant tumors of the breast	DOAP	

Topic 31: Endocrine system Number of competencies: (10)

Number of competencies that require certification: (NIL)

PA31.1	Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings	LGT, SGT	
PA31.2	Describe the etiology, cause, iodine dependency, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis	LGT, SGT	
PA31.3	Describe the etiology, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis/ hypothyroidism	LGT, SGT	
PA31.4	Classify and describe the epidemiology, etiology, pathogenesis, pathology, clinical laboratory features & complications of Thyroid tumors	LGT, SGT	
PA31.5	"Classify and describe the epidemiology, etiology, pathogenesis, pathology, clinical laboratory features, complications and progression of diabetes mellitus"	LGT, SGT	
PA31.6	Describe the etiology, genetics, pathogenesis, manifestations, laboratory and morphologic features of hyperparathyroidism	LGT, SGT	
PA31.7	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications and metastases of pancreatic cancer	LGT, SGT	
PA31.8	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of adrenal insufficiency	LGT, SGT	
PA31.9	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of	LGT, SGT	

	Cushing's syndrome		
PA31.10	Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	DOAP	

Topic 32: Bone and soft tissue Number of competencies: (07)

Number of competencies that require certification: (NIL)

PA32.1	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis	LGT, SGT	
PA32.2	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and metastases of bone tumors"	LGT, SGT	
PA32.3	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and metastases of soft tissue tumors	LGT, SGT	
PA32.4	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of Paget's disease of the bone	LGT, SGT	
PA32.5	Classify and describe the etiology, immunology, pathogenesis, manifestations, radiologic and laboratory features, diagnostic criteria and complications of rheumatoid arthritis	LGT, SGT	
PA32.6	Classify and describe the etiology, pathogenesis, manifestations, radiologic and laboratory features, diagnostic criteria and complications of Osteo arthritis and Gouty arthritis	LGT, SGT	
PA32.7	Describe and identify the morphologic and microscopic features of diseases and tumors of bone	DOAP	

Topic 33: Skin Number of competencies: (04)

Number of competencies that require certification:(NIL)

PA33.1	Describe the risk factors pathogenesis, pathology and natural history of squamous cell carcinoma of the skin	LGT, SGT	
PA33.2	Describe the risk factors pathogenesis, pathology and natural history of basal cell carcinoma of the skin	LGT, SGT	
PA33.3	Describe the distinguishing features between a nevus and melanoma. Describe the etiology, pathogenesis, risk factors morphology clinical features and metastases of melanoma	LGT, SGT	
PA33.4	Identify, distinguish and describe common tumors of the skin	DOAP	

Topic 34: Central Nervous System Number of competencies:(03)

Number of competencies that require certification: (01)

PA34.1	Describe the etiology, types and pathogenesis, differentiating factors, CSF findings in meningitis	LGT, SGT	
PA34.2	Classify and describe the etiology, genetics, pathogenesis, pathology, presentation sequelae and complications of CNS tumors	LGT, SGT	
PA34.3	Identify the etiology of meningitis based on given CSF parameters	DOAP	1

Topic 35: Eye Number of competencies: (01)

Number of competencies that require certification: (NIL)

PA35.1	Describe the etiology, genetics, pathogenesis, pathology, presentation, sequelae and complications of retinoblastoma	LGT, SGT	
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ASSESSMENT

Attendance

There shall be a minimum of 75% attendance in theory and 80% attendance in practical for eligibility to appear for the examinations in that subject.

Internal Assessment

Scheme for calculation of internal assessment marks:

Theory (maximum marks)	Marks	Practical (Maximum Marks)	Marks
1st Terminal Examination	20	1st Terminal Examination	20
2nd Terminal Examination	20	2nd Terminal Examination	20
Preliminary Examination	40	Preliminary Examination	40
Day to day assessment, Seminar, Project, SDL, Group discussion & Others	20	Day to day assessment, Seminar, Project, SDL, Group discussion & Others	20
Total	100	Total	100

- Internal assessment should be based on competencies and skills.
- Regular periodic examinations shall be conducted throughout the course. There shall be three internal assessment examinations in each subject. The third internal examination is the preliminary examination to be conducted on the lines of the university examination.
- A candidate must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject.
- Day to day records and log book (including required skill certifications) should be given importance in internal assessment. Internal assessment should be based on competencies and

skills.

- Level of participation in self-directed learning, assignments, seminars, clinical case presentation, project work will be assessed and importance will be given in internal assessment.
- Internal assessment marks will not be added to university examination marks and will reflect as a separate head of passing at the summative examination.
- The results of internal assessment should be displayed on the notice board within 1-2 weeks of the test.
- The internal and formative assessments provide ideal opportunities for students and teachers to identify learning gaps. Teachers should provide high quality feedback to each student to enable them to bridge these learning gaps.
- Formative assessments also enable the early identification of students who are struggling to achieve the intended learning outcomes. Early and appropriate targeted remediation must be planned for such students.

University Assessment

- University examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary knowledge, minimal level of skills, ethical and professional values with clear concepts of the fundamentals which are necessary for him to function effectively and appropriately as a physician of the first contact.
- Nature of questions in theory examinations shall include different types such as structured essays like Long-Answer Questions (LAQ), Short-Answer Questions (SAQ) and Multiple-Choice Questions (MCQ) shall be accorded minimum 20% weightage of the total marks of each theory paper, Scenario based MCQs shall be accorded more weightage in view of NEXT.
- Practical/clinical examinations shall be conducted in the laboratories and /or hospital wards and a blueprint must be used. The objective will be to assess proficiency and skills to conduct experiments, interpret data and form logical conclusion. Clinical cases kept in the examination must be common conditions that the learner may encounter as a physician of first contact in the community.
 - Application based questions should be included for newer CBME components like foundation course, ECE, AETCOM, Integrated topics, student-learner methods etc. in all theory, practical and clinical examinations of all internal assessments and university assessment.

- Criteria for passing in a subject:

A candidate shall obtain a cumulative 50% marks in university conducted examination including theory and practical and not less than 40% separately in Theory and in Practical in order to be declared as passed in that subject. In subjects that have two papers, the learner must secure a minimum 40% marks in aggregate (both theory papers together).

THEORY EXAMINATION PATTERN

There shall be two theory papers of 100 marks each and duration of each paper will be of 3 hours.

Question Paper I and II pattern: Section-A (50 Marks)

Q 1.	Long essay question (Structured / Case Based) (any 1 out of 2) 1x10	10
Q 2.	Short Answer Questions (Structured / Case Based) (any 6 out of 7) 6 x 5 (One Question on AETCOM is compulsory)	30
Q 3.	Objective type Answer Questions (any 5 out of 6) 5 x 2	10
	Total	50

Question Paper I and II pattern: Section-B (50 Marks)

Q 4.	Long essay question (Structured / Case Based) (any1 out of 2) 1x10	10
Q 5.	Short Answer Questions (Structured / Case Based) (any 6 out of 7) 6 x 5	30
Q 6.	MCQs Questions (any 10 out of 10) 10 x 1	10
	Total	50

Pathology Department
Topic Distribution Paper I & II

<u>Topics of Pathology Paper – I</u>	
Topic	Competency No.
Introduction to Pathology	PA 1.1,1.2,1.3
Cell Injury and Adaptation	PA 2.1 TO 2.8
Inflammation	PA 3.1 TO 3.4
Healing and Repair	PA 4.1
Hemodynamic disorder	PA 5.1 TO 5.6
Neoplastic disorders	PA 6.1 TO 6.7
Immunopathology and AIDS	PA 8.1 TO 8.6
Amyloidosis	PA 9.1,9.2
Infections and Infestations	PA 10.1 TO 10.5
Genetic and Pediatric diseases	PA 11.1 TO 11.3
Environmental and nutritional diseases	PA 12.1 TO 12.3
Hematology	PA 13,14,15,16,17,18,20 (TOTAL 18)
Blood banking and transfusion	PA 21.1 TO 21.6
AETCOM	Module number 2.4

<u>Topics of Pathology Paper – II</u>	
Topic	Competency No.
Basic diagnostic cytology	PA 7.1
Lymph node and spleen pathology	PA 19.1 TO 19.6
Clinical pathology	PA 22.1,22.2
Gastrointestinal Tract pathology	PA 23.1 TO 23.9
Hepatobiliary system pathology	PA 24.1 TO 24.9
Respiratory system pathology	PA 25.1 TO 25.7
Cardiovascular system pathology	PA 26.1 TO 26.10
Urinary Tract pathology	PA 27.1 TO 27.17
Male genital tract pathology	PA 28.1 TO 28.6
Female genital tract pathology	PA 29.1 TO 29.10
Breast pathology	PA 30.1 TO 30.5
Endocrine system pathology	PA 31.1 TO 31.10
Bone and soft tissue pathology	PA 32.1 TO 32.7
Skin pathology	PA 33.1 TO 33.4
Central Nervous System pathology	PA 34.1 TO 34.3
Eye pathology	PA 35.1
AETCOM	Module number 2.7

PRACTICAL EXAMINATION PATTERN: 100 Marks

No	Type of exercise	Marks
Practical 1	SPOTTING (Instruments, Test & its interpretation, Clinical cases Reagents etc.)	10
Practical 2	Competency Based Cases of Hematological Conditions	20
Practical 3	Competency Based Cases of Clinical Pathology	20
Practical 4	HPE slides (Applied aspect of Histopathology & Viva Voce)	10
Practical 5	TRAY VIVA VOCE	20
Practical 6	VIVA VOCE OF Gross SPECIMENS (Gross pathology of Diseased organs -& its applied aspect: theory-etio-pathogenesis-clinical presentation, diagnosis & differential diagnosis)	20
	Total	100

LIST OF RECOMMENDED BOOKS

Title	Author
Robbins & Kumar Basic Pathology	Vinay Kumar
Textbook of Pathology	Harsh Mohan
Essentials of Hematology	Shirish M. Kawthalkar
Textbook of Haematology	Tejindar Singh
Hematopathology atlas	Tejindar Singh
De Gruchy's clinical Haematology in medical practice	Renu Saxena & 7 More
Dacie and Lewis Practical Haematology	Barbara J. Bain, Imelda Bates
Essentials in Hematology and Clinical Pathology	Ramadas Nayak & Sharada Rai
Essentials of Clinical Pathology	Shirish M. Kawthalkar
Pathology quick review and MCQs	Harsh Mohan
Practical Pathology as Per Competency Based Medical Education Curriculum NMC	Harsh Mohan
Practical Pathology	Harsh Mohan