MGM INSTITUTE OF HEALTH SCIENCES

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COMPETENCY BASED MEDICAL EDUCATION

(CBME)

(With effect from 2019-20 Batches)

Curriculum for Second M.B.B.S

Pathology

Amended upto BOM 63/2021, dated 17/02/2021

Dr. Rajesh B. Goel
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IInd MBBS CBME Curriculum

Pathology

	Hrs
Lectures	80
Integrated	26
Small group Discussions	14
Tutorials	18
Seminars	18
DOAP/ Practicals	62
SDL	12
Total :	230 hrs

	Sr. No.	COMPETENCY The student should be able to	Suggested Teaching Learning Method	Topics	Number of Hours
Topic: Introduction to Pathology	PA1.1	Describe the role of a pathologist in diagnosis and management of disease	Lecture	Introduction & Departmental orientation	1
	PA1.2	Enumerate common definitions and terms used in Pathology.		Introduction, history and evaluation. Common definitions in pathology and causes of cell injury.	
	PA 1.3	Describe the history and evolution of			

		Pathology			
Cell injury and Adaptation	PA2.1	Demonstrate knowledge of the causes, mechanisms, types and effects of cell injury and their clinical significance	Lecture	Modes of cell injury: Mechanisms of cell injury	1
	PA2.2	Describe the etiology of cell injury. Distinguish between reversible-irreversible injury: mechanisms; morphology of cell injury.	Lecture	Reversible cell injury: Definitions, cellular swelling, fatty change. Irreversible cell injury: Definition Necrosis: definitions & types	1
	PA2.3	Intracellular accumulation of fats, proteins, carbohydrates, pigments.	Lecture	Intracellular accumulations & alterations: Types of Intracellular accumulations with alterations in cell organelles & cytoskeleton.	1
	PA2.4	Describe and discuss Cell death- types, mechanisms, necrosis, apoptosis (basic as contrasted with necrosis), autolysis	Lecture	Apoptosis & its relevance. Difference Between Apoptosis and Necrosis	1
	PA 2.5	Describe and discuss pathologic	Lecture	Calcification and	1

		calcifications, gangrene		Gangrene	
	PA2.6	Describe and discuss cellular adaptations: atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia.	DOAP session	Retogressive changes & disorders of cell growths	2
	PA2.7	Describe and discuss the mechanisms of cellular aging and apoptosis	Lecture	Cellular ageing and mechanism	1
	PA2.8	Identify and describe various forms of cell injuries, their manifestations and consequences in gross and microscopic specimens	DOAP session	Necrosis & gangrene	2
Amyloidosis	PA3.1	Describe the pathogenesis and pathology of amyloidosis	Lecture	Amyloidosis: Definition, physical & chemical nature of amyloid, classification, pathogenesis, morphology, lab diagnosis with special stain & clinical correlation.	1
	PA 3.2	Identify and describe amyloidosis in a pathology session.	DOAP session	Amyloidosis:morphology, lab diagnosis with special stain.	2

Inflammation	PA4.1	Define and describe the general features of acute and chronic inflammation including stimuli, vascular and cellular events	Lecture	Acute inflammation: Define & describe cellular & vascular changes. Outcomes & morphological patterns of acute inflammation.	1
	PA4.2	Enumerate and describe the mediators of acute inflammation	Lecture	Chemical mediators of inflammation: definition, classification, description of each type, role in acute & chronic inflammation.	1
	PA4.3	Define and describe chronic inflammation including causes, types, non-specific and granulomatous; and enumerate examples of each	Lecture	Chronic inflammation: definition & causes.Granulomatous inflammation: etiology, pattern & systemic effects of granulomas.	1
	PA 4.4	Identify and describe acute and chronic inflammation in gross and microscopic specimens	DOAP session	Acute inflammation ,Chronic inflammation & repair	2
Healing and repair	PA5.1	Define and describe the process of repair and regeneration including wound healing and its types	Lecture	Regeneration & repair: Healing by primary & secondary intention with local & systemic factors affecting wound healing. Repair in	1

				specialized tissue:	
Hemodynamic disorders	PA6.1	Define and describe edema, its types, pathogenesis and clinical correlations	Lecture	Edema: Define, classify, pathogenesis & correlate morphology with clinical significance	1
	PA6.2	Define and describe hyperemia, congestion, hemorrhage.	Lecture	Hyperemia, congestion, hemorrhage.	1
	PA6.3	Define and describe shock, its pathogenesis and its stages	Lecture	Shock: Define, classify, pathogenesis, mediators & stages of shock.	1
	PA6.4	Define and describe normal haemostasis and the etiopathogenesis and consequences of thrombosis	Lecture	Thrombosis: Definition, etiopathogenesis, morphology, fate & effects of thrombosis.	1
	PA6.5	Define and describe embolism and its causes and common types	Lecture	Embolism : Define types with clinical significance.	1
	PA6.6	Define and describe Ischaemia/infarction its types, etiology, morphologic changes and clinical effects	Lecture	Hyperemia & congestion ,Infarction: Define types with clinical significance.	1

	PA 6.7	Identify and describe the gross and microscopic features of infarction in a pathologic specimen	DOAP session	Circulatory disturbance	2
Neoplastic disorders	PA7.1	Define and classify neoplasia. Describe the characteristics of neoplasia including gross, microscopy biologic, behaviour and spread. Differentiate between benign from maignant neoplams	Lecture	Nomenclature, classification & differentiation between benign & malignant neoplasms.Precancerous lesions.	1
	PA7.2	Describe the molecular basis of cancer.	Lecture	Molecular basis of cancer & Biology of tumor growth	1
	PA7.3	Enumerate carcinogens and describe the process of carcinogenesis	Lecture	Carcinogenesis	1
	PA7.4	Describe the effects of tumor on the host including paraneoplastic syndrome	Lecture	Tumor host interactions: Systemic effects & paraneoplastic syndromes.	1
	PA7.5	Describe immunology and the immune response to	Lecture	Lab Diagnosis: Diagnostic workup including tumor markers..Spread, grading &	1

		cancer		staging.Tumor immunology	
Basic diagnostic cytology	PA8.1	Describe the diagnostic role of cytology and its application in clinical care	Tutorials	Cytology and its application (FNAC)	2
	PA 8.2	Describe the basis of exfoliative cytology including the technique & stains used.	Tutorials	Exfoliative cytology	2
	PA 8.3	Observe a diagnostic cytology and its staining and interpret the specimen.	DOAP session	Cytology and stains	2
Immunopathology and AIDS	PA9.1	Describe the principles and mechanisms involved in immunity.	Lecture	Principles and mechanisms involved in immunity.	1
	PA9.2	Describe the mechanism of hypersensitivity reaction.		Hypersensitivity reactions: Types & differentiate between different types of hypersensitivity reactions.	
	PA9.3	Describe the HLA system and the immune principles involved in transplant and mechanism of transplant rejection.	Seminar	Transplant rejections & HLA System	2

	PA9.4	Define autoimmunity. Enumerate autoimmune disorders.	Lecture	Autoimmune diseases: Mechanism of autoimmunity.	1
	PA9.5	Define and describe the pathogenesis of systemic Lupus Erythematosus.		Systemic Lupus Erythematosus	
	PA9.6	Define and describe the pathogenesis and pathology of HIV and AIDS.	Lecture	AIDS: Epidemiology, etiopathogenesis.	1
	PA9.7	Define and describe the pathogenesis of other common autoimmune diseases	Tutorials	Common autoimmune diseases.	2
Infections and infestations	PA10.1	Define and describe the pathogenesis and pathology of malaria	Integrated	Parasitic: Malaria: Types, morphological features in P. Vivax & Falciparum Malaria & lab diagnosis.	1
	PA10.2	Define and describe the pathogenesis and pathology of cysticercosis .	Small group Discussion	Leishmaniasis, Filariasis, Hydatid, Cysticercosis	1
	PA10.3	Define and describe the pathogenesis and pathology of leprosy	Integrated	Leprosy: Classify, pathogenesis, differentiate between different types of leprosy, histological features & sequelae.	1

	PA10.4	Define and describe the pathogenesis and pathology of common bacterial, viral, protozoal and helminthic diseases	Lecture	Typhoid fever: Pathogenesis, morphology & clinical features. Syphilis: Classify various stages, pathogenesis & morphology.	1
Genetic and paediatric diseases	PA11.1	Describe the pathogenesis and features of common cytogenetic abnormalities and mutations in childhood.	Small group Discussion	Cytogenetic abnormalities and mutations in childhood.	1
	PA11.2	Describe the pathogenesis and pathology of tumor and tumour- like conditions in infancy and childhood	Seminar	Tumor and tumour-like conditions in infancy and childhood	2
	PA11.3	Describe the pathogenesis of common storage disorders in infancy and childhood	Seminar	Storage disorders in infancy and childhood	2
Environmental and nutritional diseases	PA12.1	Enumerate and describe the pathogenesis of disorders caused by air pollution, tobacco and alcohol	Seminar	Disorders caused by air pollution, tobacco and alcohol	2
	PA12.2	Describe the pathogenesis of	Seminar	Protein calorie malnutrition and	2

		disorders caused by protein calorie malnutrition and starvation		starvation	
	PA12.3	Describe the pathogenesis of obesity and its consequences	Integrated	Obesity	1
Introduction to haematology	PA13.1	Describe hematopoiesis and extramedullary hematopoiesis.	Lecture	Introduction to hematology & hemopoiesis	1
	PA13.2	Describe the role of anticoagulants in hematology	DOAP session	Anticoagulants , Blood collection & Hb Estimation	2
	PA13.3	Define and classify anemia.	Lecture	Anemia: classification and clinical features.	1
	PA13.4	Enumerate and describe the investigation of anemia			
	PA 13.5	Perform, Identify and describe the peripheral blood picture in anemia	DOAP session	PCV, ESR & Peripheral Smear	2
Microcytic anemia	PA14.1	Describe iron metabolism.	Lecture	Iron metabolism.	1
	PA14.2	Describe the etiology, investigations and differential diagnosis of microcytic hypochromic anemia		Nutritional anemia: Iron deficiency.	
	PA	Identify and	DOAP	Development of	2

	14.3	describe the peripheral blood picture of microcytic anemia	session	Blood & BM , Peripheral smear findings in microcytic anemia	
Macrocytic anemia	PA15.1	Describe the metabolism of Vitamin B12 and the etiology and pathogenesis of B12 deficiency.	Integrated	Metabolism, etiology and pathogenesis of Vitamin B12	1
	PA15.2	Describe laboratory investigations of macrocytic anemia	Lecture	laboratory investigations in Folic acid/ Vit B12 deficiency anemia including pernicious anemia.	1
	PA 15.3	Identify and describe the peripheral blood picture of macrocytic anemia.	DOAP session	Peripheral smear findings in macrocytic anemia & anemia Charts	2
	PA15.4	Enumerate the differences and describe the etiology and distinguishing features of megaloblastic and non-megaloblastic macrocytic anemia	Tutorials	Megaloblastic and non-megaloblastic macrocytic anemia	2
Hemolytic anemia	PA16.1	Define and classify hemolytic anemia.	Integrated	Classification of hemolytic anemia.	1
	PA16.2	Describe the pathogenesis and	Lecture	Hemolytic anemia: Definition,	1

		clinical features and hematologic indices of hemolytic anemia		classification, pathogenesis and investigations.	
	PA16.3	Describe the pathogenesis, features, hematologic indices and peripheral blood picture of sickle cell anemia and thalassemia.	Lecture	Haemoglobinopathies: Thalassemia, Sickle cell anemia.	1
	PA16.4	Describe the etiology pathogenesis, hematologic indices and peripheral blood picture of Acquired hemolytic anemia	Lecture	Hereditary spherocytosis and G6PD deficiency	1
	PA16.5	Describe the peripheral blood picture in different hemolytic anaemias	Integrated	Peripheral blood picture in different hemolytic anaemias	1
	PA 16.6	Prepare a peripheral blood smear and identify hemolytic anaemia from it	DOAP session	PS Staining & Dfferential WBC count	2
	PA16.7	Discribe the correct technique to perform a cross match	DOAP session	Blood group estimation and correct technique to perform a cross match	2
Aplastic	PA	Enumerate the	Tutorials	Aplastic anemia	2

anemia	17.1	etiology, pathogenesis and findings in aplastic anemia			
	PA17.2	Enumerate the indications and describe the findings in bone marrow aspiration and biopsy	DOAP session	Development of blood & bone marrow examination.	2
Leukocytic disorder	PA18.1	Enumerate and describe the causes of leucocytosis leucopenia lymphocytosis and leukemoid reactions	DOAP session	Total WBC Count / Leukemia/ Leucocytosis, leucopenia, Leukemoid reaction	2
	PA`18.2	Describe the etiology, genetics, pathogenesis classification, features, hematologic features of acute and chronic leukemia	Lecture	Acute leukemia: classification and diagnosis. Chronic leukemia: classification and diagnosis.	1
Lymph node and spleen	PA19.1	Enumerate the causes and describe the differentiating features of lymphadenopathy .	Small group discussion	Lymphadenitis: Non-specific	1
	PA19.2	Describe the pathogenesis and pathology of tuberculous lymphadenitis.		Lymphadenitis: granulomatous	

	PA 19.3	Identify and describe the features of tuberculous lymphadenitis in a gross and microscopic specimen	DOAP session	Lymphnode	2
	PA19.4	Describe and discuss the pathogenesis, pathology and the differentiating features of Hodgkin's and non-Hodgkin's lymphoma.	Lecture	Hodgkin's and non-Hodgkin's lymphoma.	1
	PA 19.5	Identify and describe the features of Hodgkin's lymphoma in a gross and microscopic specimen	DOAP session	Hodgkin's lymphoma in a gross and microscopic specimen and Tumor Pathology (Benign & Malignant tumors)	2
	PA19.6	Enumerate and differentiate the causes of splenomegaly.	Integrated	Diseases of spleen: Splenomegaly and effects	1
	PA 19.7	Identify and describe the gross specimen of an enlarged spleen	DOAP session	Gross specimen of an enlarged spleen & Leukemias	2
Plasma Cell disorders	PA 20.1	Describe the features of plasma cell myeloma	DOAP session	Plasma cell myeloma & other bone tumors	2
Hemorrhagic disorders	PA21.1	Describe normal hemostasis.	Lecture	Hemorrhagic disorders: Classify	1

	PA21.2	Classify and describe the etiology, pathogenesis and pathologyof vascular and platelet disorders including ITP and haemophilia's.		and lab. Screening tests for hemorrhagic disorders. Platelet deficiency, ITP & hemophilia	
	PA21.3	Differentiate platelet from clotting disorders based on the clinical and hematologic features.	DOAP session	Coagulopathies: Coagulation factor deficiency, DIC /Bleeding Disorders	2
	PA21.4	Define and describe disseminated intravascular coagulation, its laboratory findings and diagnosis of disseminated intravascular coagulation.	Integrated	DIC	1
	PA21.5	Define and describe disseminated intravascular coagulation, its laboratory findings and diagnosis of Vitamin K deficiency	Seminar	DIC & Vitamin K deficiency	2

Blood banking and transfusion	PA22.1	Classify and describe blood group systems (ABO and RH).	Lecture	Blood groups and its relevance in transfusion medicine and hematology. Erythoblastosis foetalis.	1
	PA22.2	Enumerate the indications, describe the principles, enumerate and demonstrate the steps of compatibility testing			
	PA22.4	Enumerate blood components and describe their clinical uses	Lecture	Blood Components & Autologous Transfusion	1
	PA22.5	Enumerate and describe infections transmitted by blood transfusion.	Tutorials	Blood transfusion transmissible infections including HIV and hepatitis.	2
	PA22.6	Describe transfusion reactions and enumerate the steps in the investigation of a transfusion reaction	Lecture	Blood transfusion: Indications, selection of donor criteria, cross matching, untoward reactions.	1
	PA22.7	Enumerate the indications and describe the principles and procedure of autologous transfusion	Small group discussion	Autologous transfusion	1
Clinical Pathology	PA 23.1	Describe abnormal urinary	DOAP session	Urine Examination	2

		findings in disease states and identify and describe common urinary abnormalities in a clinical specimen			
	PA23.2	Describe abnormal findings in body fluids in various disease states	Small group discussion	Body fluids	1
	PA 23.3	Describe and interpret the abnormalities in a panel containing semen analysis, thyroid function tests, renal function tests or liver function tests	DOAP session	Thyroid function tests, renal function tests or liver function tests (Charts)	2
Gastrointestinal tract	PA24.1	Describe the etiology, pathogenesis, pathology and clinical features of oral cancers	Lecture	Precancerous lesions of oral cavity and oral cancers: etiopathogenesis, gross and microscopic features. Differential diagnosis of swelling of salivary gland.	1
	PA24.2	Describe the etiology, pathogenesis, pathology, microbiology, clinical and microscopic features of peptic ulcer disease.	Lecture	Peptic ulcer: definition, etiopathogenesis, gross and microscopic features and complications.	1

	PA24.3	Describe and identify the microscopic features of peptic ulcer	DOAP session	Ulcers and tumors of intestine & Stomach (GIT)	2
	PA24.4	Describe and etiology and pathogenesis and pathologic features of carcinoma of the stomach	Lecture	Tumors of upper Gastrointestinal Tract: Gastric carcinoma: etiopathogenesis, classification, gross and microscopic features and clinical features. Carcinoid tumors of GIT. Esophagus: etiopathogenesis, morphology and clinical features.	1
	PA24.5	Describe and etiology and pathogenesis and pathologic features of Tuberculosis of the intestine	Lecture	Ulcerative lesions of GIT	1
	PA24.6	Describe and etiology and pathogenesis and pathologic and distinguishing features of Inflammatory bowel disease	Lecture	Idiopathic inflammatory bowel disease: etiopathogenesis, morphology and differences between Crohn's disease and ulcerative colitis	1
	PA24.7	Describe the etiology, pathogenesis, pathology and distinguishing features of carcinoma of the	Lecture	Tumors of lower Gastrointestinal Tract: Carcinoma colon- Etiopathogenesis, morphology and clinical features.	1

		colon		Intestinal polyps and gastrointestinal stromal tumors.	
Hepatobiliary system	PA25.1	Describe bilirubin metabolism, enumerate the etiology and pathogenesis of jaundice, distinguish between direct and indirect hyperbilirubinemia	Integrated	Jaundice	1
	PA25.2	Describe the pathophysiology and pathologic changes seen in hepatic failure and their clincial manifestations, complications and consequences	Integrated	Hepatic failure	1
	PA25.3	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	Lecture	Viral hepatitis: Etiopathogenesis, types, clinical source, pathology, serologic diagnosis, sequelae.	1
	PA25.4	Describe the pathophysiology, pathology and	Lecture	Alcoholic liver disease: Pathogenesis,	1

		progression of alcoholic liver disease including cirrhosis		morphology and correlation with clinical features.	
	PA25.5	Describe the etiology, pathogenesis and complications of portal hypertension	Lecture	Cirrhosis: Etiopathogenesis, classification, pathology, complications & differential diagnosis & Portal Hypertension	1
	PA 25.6	Interpret liver function and viral hepatitis serology panel. Distinguish obstructive from non-obstructive jaundice based on clinical features and liver function tests	DOAP session	Hepatobiliary System	2
Respiratory system	PA26.1	Define and describe the etiology, types, pathogenesis, stages, morphology and complications of pneumonia	DOAP session	Respiratory I & II	2
	PA26.2	Describe the etiology, gross and microscopic appearance and complications of lung abscess	Tutorials	Lung abscess: Etiopathogenesis, Morphology and complications.and atelectasis and hyaline membrane disease.	2
	PA26.3	Define and describe the etiology, types,	Lecture	Chronic obstructive pulmonary disease: Bronchial asthma	1

		pathogenesis, stages, morphology and complications and evaluation of Obstructive airway disease (OAD) and bronchiectasis		and Bronchiectasis - Etiopathogenesis, Morphology and complications.	
			Lecture	Chronic bronchitis and Emphysema: Etiopathogenesis, Morphology types of emphysema and complications	1
	PA26.4	Define and describe the etiology, types, pathogenesis, stages, morphology microscopic appearance and complications of tuberculosis	Integrated	Pulmonary tuberculosis: primary and secondary, morphologic types including pleuritis, clinical course.	1
	PA26.5	Define and describe the etiology, types, exposure, environmental influence, pathogenesis, stages, morphology, microscopic appearance and complications of Occupational lung disease	Lecture	Occupational lung disorders: Anthracosis, silicosis, asbestosis, mesothelioma.	1
	PA26.6	Define and describe the etiology, types, exposure, genetics environmental influence,	Lecture	Tumors of lung and pleura: Classification, etiopathogenesis, gross and microscopic features, pattern of spread,	1

		pathogenesis, stages, morphology, microscopic appearance,metastases and complications of tumors of the lung and pleura		staging, clinical course, para-neoplastic syndromes.	
	PA26.7	Define and describe the etiology, types, exposure, genetics environmental influence, pathogenesis, morphology, microscopic appearance and complications of mesothelioma	Integrated	Complications of mesothelioma	1
Cardiovascular system	PA27.1	Distinguish arteriosclerosis from atherosclerosis. Describe the pathogenesis and pathology of various causes and types of arteriosclerosis	Lecture	Atherosclerosis: Definition, etiopathogenesis, gross and microscopic features, complications and clinical correlation	1
	PA27.2	Describe the etiology, dynamics, pathology types and complications of aneurysms including aortic aneurysms	Tutorials	Other diseases of blood vessels : Aneurysms & Vasculitis	2

	PA27.3	Describe the etiology, types, stages pathophysiology, pathology and complications of heart failure	Integrated	Heart failure	1
	PA27.4	Describe the etiology, pathophysiology, pathology, gross and microscopic features, criteria and complications of rheumatic fever	Lecture	Rheumatic heart disease: Incidence, etiology, Pathogenesis, morphology, complications, clinical course & investigations.	1
	PA27.5	Describe the epidemiology, risk factors, etiology, pathophysiology, pathology, presentations, gross and microscopic features, diagnostic tests and complications of ischemic heart disease	Integrated	Ischemic heart disease: Categories and pathogenesis. Myocardial infarction : incidence, risk factors, pathogenesis, morphology, complications, clinical course and investigations	1
	PA27.6	Describe the etiology, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of infective endocarditis	Lecture	Infective endocarditis: Causes, Pathogenesis, morphology, complications and differential diagnosis of cardiac vegetations.	1

	PA27.7	Describe the etiology, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of pericarditis and pericardial effusion	Lecture	Pericarditis and other pericardial diseases	1
	PA 27.8	Interpret abnormalities in cardiac function testing in acute coronary syndromes	DOAP session	Cardiovascular System including cardiac function testing in acute coronary syndromes	2
	PA 27.9	Classify and describe the etiology, types, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of cardiomyopathies	Integrated	Cardiomyopathies	1
	PA27.10	Describe the etiology, pathophysiology, pathology features and complications of syphilis on the cardiovascular system	Small group discussion	Syphilis	1
Urinary Tract	PA28.1	Describe the normal histology of the kidney	Lecture	Normal histology of the kidney & Renal failure: definitions,	1

	PA 28.2	Define, classify and distinguish the clinical syndromes and describe the etiology, pathogenesis, pathology, morphology, clinical and laboratory and urinary findings, complications of renal failure		criteria, etiology, systemic manifestations and investigations.	
	PA28.3	Define and describe the etiology, precipitating factors, pathogenesis, pathology, laboratory urinary findings, progression and complications of acute renal failure	Small group discussion	Acute renal failure	1
	PA 28.4	Define and describe the etiology, precipitating factors, pathogenesis, pathology, laboratory urinary findings progression and complications of chronic renal failure	Small group discussion	Chronic renal failure	1

	PA28.5	Define and classify glomerular diseases. Enumerate and describe the etiology, pathogenesis, mechanisms of glomerular injury, pathology, distinguishing features and clinical manifestations of glomerulonephritis	Lecture	Glomerulonephritis: Classification, Acute nephritis, rapidly progressive glomerulonephritis.	1
	PA28.6	Define and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, progression and complications of IgA nephropathy	Small group discussion	IgA nephropathy	1
	PA28.7	Enumerate and describe the findings in glomerular manifestations of systemic disease	Integrated	Glomerular manifestations of systemic disease	1
	PA28.8	Enumerate and classify diseases affecting the tubular interstitium	Lecture	Pyelonephritis and interstitial nephritis: etiopathogenesis of acute and chronic, morphology and clinical correlation.	1

	PA 28.9	Define and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, progression and complications of acute tubular necrosis	Lecture	Acute Tubular Necrosis	1
	PA28.10	Describe the etiology, pathogenesis, pathology, laboratory findings, distinguishing features progression and complications of acute and chronic pyelonephritis and reflux nephropathy	DOAP session	Renal System I & II	2
	PA28.11	Define classify and describe the etiology, pathogenesis pathology, laboratory, urinary findings, distinguishing features progression and complications of vascular disease of the kidney.	Small group discussion	Renal vascular disorders and malformations,	1
	PA28.12	Define classify and describe the genetics,	Small group discussion	Polycystic kidney.	1

		inheritance, etiology, pathogenesis, pathology, laboratory, urinary findings, distinguishing features, progression and complications of cystic disease of the kidney			
	PA28.13	Define classify and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, distinguishing features progression and complications of renal stone disease and obstructive uropathy	Lecture	Nephrolithiasis and obstructive nephropathy	1
	PA28.14	Classify and describe the etiology, genetics, pathogenesis, pathology, presenting features, progression and spread of renal tumors	Lecture	Tumors of kidney and pelvis: classifications, morphology, clinical course and paraneoplastic syndromes of common tumors.	1
	PA28.15	Describe the etiology, genetics, pathogenesis, pathology,	Small group discussion	Thrombotic angiopathies	1

		presenting features and progression of thrombotic angiopathies			
	PA28.16	Describe the etiology, genetics, pathogenesis, pathology, presenting features and progression of urothelial tumors	Lecture	Urinary bladder: cystitis and carcinoma	1
Male Genital Tract	PA29.1	Classify testicular tumors and describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of testicular tumors	Lecture	Testicular tumors	1
	PA29.2	Describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the penis	Lecture	Carcinoma of penis	1
	PA29.3	Describe the pathogenesis, pathology, hormonal dependency	Integrated	Prostate : prostatitis Nodular hyperplasia, carcinoma	1

		presenting and distinguishing features, urologic findings & diagnostic tests of benign prostatic hyperplasia			
	PA29.4	Describe the pathogenesis, pathology, hormonal dependency presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the prostate	Lecture	Prostate : carcinoma	1
	PA29.5	Describe the etiology, pathogenesis, pathology and progression of prostatitis	DOAP session	Male Genital System	2
Female Genital Tract	PA30.1	Describe the epidemiology, pathogenesis, etiology, pathology, screening, diagnosis and progression of carcinoma of the cervix	Lecture	Diseases of cervix: cervicitis, cervical carcinoma, etiology cytological diagnosis	1
	PA30.6	Describe the etiology and morphologic features of			

		cervicitis			
	PA30.2	Describe the pathogenesis, etiology, pathology, diagnosis and progression and spread of carcinoma of the endometrium	Lecture	Carcinoma of the endometrium	1
	PA30.3	Describe the pathogenesis, etiology, pathology, diagnosis and progression and spread of carcinoma of the leiomyomas and leiomyosarcomas.	DOAP session	Female Reproductive System	2
	PA30.4	Classify and describe the etiology, pathogenesis, pathology, morphology, clinical course, spread and complications of ovarian tumors	Lecture	Ovarian tumours	1
	PA30.5	Describe the etiology, pathogenesis, pathology, morphology, clinical course, spread and complications of gestational trophoblastic	Lecture	Trophoblastic diseases: hydatidiform mole, choriocarcinoma.	1

		neoplasms			
	PA30.7	Describe the etiology, hormonal dependence, features and morphology of endometriosis	Integrated	Diseases of Uterus: Endometriosis & adenomyosis.	1
	PA30.8	Describe the etiology and morphologic features of adenomyosis	Integrated	Adenomyosis	1
	PA30.9	Describe the etiology, hormonal dependence and morphology of endometrial hyperplasia	Integrated	Endometrial hyperplasia	1
Breast	PA31.1	Classify and describe the types, etiology, pathogenesis, pathology and hormonal dependency of benign breast disease	Lecture	Breast: Non-neoplastic Lesions	1
	PA31.4	Enumerate and describe the etiology, hormonal dependency and pathogenesis of gynecomastia			
	PA31.2	Classify and describe the epidemiology,	Lecture	Neoplastic lesions of the breast-Classification,	1

		pathogenesis, classification, morphology, prognostic factors, hormonal dependency, staging and spread of carcinoma of the breast		Morphology, grading of carcinoma of breast and differential diagnosis of breast swellings.	
	PA 31.3	Describe and identify the morphologic and microscopic features of carcinoma of the breast	DOAP session	Tumors of Breast and Diseases of the endocrine organs	2
Endocrine system	PA32.1	Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings	Lecture	Thyroid: Differential diagnosis of thyroid nodule.	1
	PA32.2	Describe the etiology, cause, iodine dependency, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis	Tutorials	Thyrotoxicosis	2
	PA 32.3	Describe the etiology, pathogenesis, manifestations, laboratory and	Integrated	Thyrotoxicosis/ Hypothyroidism	1

		imaging features and course of thyrotoxicosis/ hypothyroidism			
	PA32.4	Classify and describe the epidemiology, etiology, pathogenesis, pathology, clinical laboratory features, complications and progression of diabetes mellitus	Integrated	Diabetes mellitus: Classification, pathogenesis of system involvement, sequelae and complications.	1
	PA32.5	Describe the etiology, genetics, pathogenesis, manifestations, laboratory and morphologic features of hyperparathyroidism	Small group discussion	Parathyroid hyperplasias and tumours, hyperparathyroidism. Pituitary tumours	1
	PA32.6	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications and metastases of pancreatic cancer	Integrated	Pancreatic cancer	1
	PA32.7	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features,	Seminar	Adrenal diseases: Cortical hyperplasia, atrophy, tuberculosis.	2

		complications of adrenal insufficiency			
	PA32.8	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of Cushing's syndrome	Seminar	Cushing's syndrome	2
	PA32.9	Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	Seminar	Adrenal diseases: tumours of cortex and medulla	2
Bone and soft tissue	PA33.1	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis	Lecture	Osteomyelitis and Metabolic diseases: rickets / osteomalacia, osteoporosis, hyperparathyroidism	1
	PA33.2	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and	Lecture	Tumors: Primary, osteosarcoma, osteoclastoma, Ewing’s sarcoma, chondrosarcoma, metastatic	1

		metastases of bone tumors			
	PA33.3	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and metastases of soft tissue tumors	Small group discussion	Classification, morphological features of lipomatous, fibrous, blood vessels tumours, Neural, muscle and fibro histiocytic tumours.	1
	PA33.4	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of Paget's disease of the bone	Integrated	Paget's disease of the bone	1
	PA33.5	Classify and describe the etiology, immunology, pathogenesis, manifestations, radiologic and laboratory features, diagnostic criteria and complications of rheumatoid arthritis	Integrated	Arthritis: rheumatoid, osteoid and tuberculosis	1
Skin	PA34.1	Describe the risk factors pathogenesis, pathology and	Lecture	Skin tumours: Non-pigmented - classification and morphology & Basal	1

		natural history of squamous cell carcinoma of the skin		Cell Carcinoma	
	PA34.2	Describe the risk factors pathogenesis, pathology and natural history of basal cell carcinoma of the skin			
	PA34.3	Describe the distinguishing features between a nevus and melanoma. Describe the etiology, pathogenesis, risk factors morphology clinical features and metastases of melanoma	Lecture	Skin tumours: pigmented-classification and morphological features of common nevi and malignant melanoma.	1
	PA 34.4	Identify, distinguish and describe common tumors of the skin	DOAP session	Diseases of Skin	2
Central Nervous System	PA35.1	Describe the etiology, types and pathogenesis, differentiating factors, CSF findings in meningitis	Lecture	CSF and its disturbances: Cerebral oedema, raised intracranial pressure.Inflammatory disorders: Pyogenic and tuberculous meningitis, brain abscess, tuberculoma.	1

	PA35.2	Classify and describe the etiology, genetics, pathogenesis, pathology, presentation sequelae and complications of CNS tumors	Lecture	Classify CNS tumours -primary glioma and meningioma and metastatic.	1
	PA 35.3	Identify the etiology of meningitis based on given CSF parameters (Including CNS lesions)	DOAP session	CSF Examination Including CNS lesions	2
Eye	PA36.1	Describe the etiology, genetics, pathogenesis, pathology, presentation, sequelae and complications of retinoblastoma	Integrated	Retinoblastoma	1

Resolution No. 3.2.2.1 of BOM-62/2020: Resolved to approve the restructured Formative and Summative assessment pattern for 2nd MBBS Para-Clinical disciplines (Microbiology, Pathology, Pharmacology and FMT) which is in line with Competency Based Medical Education (CBME) curriculum guidelines as mandated by MCI. **[Annexure-46A, 46B, 46C, 46D]**

Format for Internal assessment examinations

Sr. No.	Exam	Theory	Practical
1.	1st Internal assessment examination	100	100
2.	2nd Internal assessment examination	100	100
2.	Preliminary examination	200	100
Total		**400**	**300**

- Preliminary examination pattern will be as per University examination
- Respective colleges/ departments will conduct internal assessment examinations andmaintain records of the same.

Format for Internal assessment examinations

Sr. No.	Exam	Theory	Practical
1.	Internal assessment examinations	200	200
2.	Preliminary examination	200	100
Total		**400**	**300**

Format of question paper

Time – 3 hrs. : _____

Preliminary / University examination

Each subject –2 papers (I / II) – 100 X 2 = **Total 200 Marks**

Unit I & II –1 paper **= 100 marks**

Each paper –

- **Section A** –MCQ – 20 X 1 mark = **20 Marks**
- **Section B** –
    - Answer any 5 out of 6 SAQ = **30 Marks**
    - Any one out of 2 LAQ (Structure LAQ to be made) = **10 marks**

➢ **Note: 1 AETCOM SAQ**

- **Section C** –
    - Any 5 out of 6 SAQ = **30 marks**
    - Any one out of 2 LAQ (Structure LAQ to be made) = **10 marks**

➢ **Note: At least 1 LAQ should be there clinically based.**

Format of question

paper Time – 3 hrs. Preliminary &University

Applicable from 2020-21 Batch onwards

Each subject – 2 papers (I / II) – 100 X 2 = **Total 200 Marks**

Portion:

Paper 1	**General Pathology inclusive of general Neoplasia, Hematology inclusive of transfusion medicine.** AETCOM module 2.1
Paper 2	**Systemic Pathology inclusive of Systemic Neoplasia and Clinical**

	Pathology. AETCOM module 2.6

Theory Paper Pattern and Marks Distribution:

Paper	Section	Type and Number of Questions	Marks allotted	Total Marks
Paper 1	Section A	MCQs (20)	20 X1mk each= 20Mks	20
	Section B	SAQs (5/6) (1 SAQ compulsory from AETCOM) LAQs (1/2) (Atleast 1 LAQ clinical Based)	5X 6 Mks each =30 Mks 1X 10 Mks each=10 Mks	40
	Section C	SAQs (5/6) LAQs (1/2) (Atleast 1 LAQ clinical Based)	5X 6 Mks each =30 Mks 1X 10 Mks each=10 Mks	40
TOTAL				**100**
Paper 2	Section A	MCQs (20)	20 X1mk each= 20Mks	20
	Section B	SAQs (5/6) (1 SAQ compulsory from AETCOM) LAQs (1/2) (Atleast 1 LAQ clinical Based)	5X 6 Mks each =30 Mks 1X 10 Mks each=10 Mks	40

	Section C	SAQs (5/6) LAQs (1/2) (Atleast 1 LAQ clinical Based)	5X 6 Mks each =30 Mks 1X 10 Mks each=10 Mks	40
			TOTAL	**100**

Practicals Pattern and Marks Distribution:

SPOTS	20Mks
Urine	15 Mks
PS	07 Mks
DC/TLC/BG	10Mks
Histopath	08Mks
Interpretation of charts and reports	10 Mks
Viva 1	15Mks
Viva 2	15 Mks
TOTAL	100Mks

INTERNAL EXAMS

There will be 2 Internal Exams besides prelims

There will be only one theory paper for both Internal Exams.

1st Internal Exam: End of January (Theory 100Mks, Practicals 100Mks)

2nd Internal Exam: End of April (Theory 100 Mks, Practicals 100Mks)

Portion for Internal Exams:

1st Internal Exam:

General Pathology inclusive of general Neoplasia, Hematology inclusive of transfusion medicine.

2nd Internal Exam:

Systemic Pathology - inclusive of Systemic – Oral cavity, thyroid, Gastrointestinal System, Liver, Lymphnode, Respiratory system, cardiovascular system, renal system.

Prelims:

Paper 1	**General Pathology inclusive of general Neoplasia, Hematology inclusive of transfusion medicine** AETCOM module 2.1
Paper 2	**Systemic Pathology inclusive of Systemic Neoplasia and Clinical Pathology.** AETCOM module 2.6

1St and 2nd Internal Exams: (Time 3hrs)

Theory Paper Pattern and Marks Distribution:

Paper	**Section**	**Type and Number of Questions**	**Marks alloted**	**Total Marks**
1 theory Paper only	Section A	MCQs (20)	20 X1mk each= 20Mks	20
	Section B	SAQs (5/6) (1 SAQ compulsory from	5X 6 Mks each =30 Mks	40

		AETCOM) LAQs (1/2) (Atleast 1 LAQ clinical Based)	1X 10 Mks each=10 Mks	
	Section C	SAQs (5/6) LAQs (1/2) (Atleast 1 LAQ clinical Based)	5X 6 Mks each =30 Mks 1X 10 Mks each=10 Mks	40
			TOTAL	**100**

Practicals Pattern and Marks Distribution:

SPOTS	20Mks
Urine	15 Mks
PS	07 Mks
DC/TLC/BG	10Mks
Histopath	08Mks
Interpretation of charts and reports	10 Mks
Viva 1	15Mks
Viva 2	15 Mks
TOTAL	100Mks

Internal assessment calculation

Sr. No.	Criteria	Theory	Practical
1.	*All internal assessment examinations including preliminary examination	80	60
2.	Day to Day assessment		
	➢ Day to Day assessment (PBL/ One line questions/ MCQ)	20	-
	➢ Day to Day assessment (Viva/ Seminars/ OSPE/ SDL)	-	20
3.	Logbook + Journals (Journal + AETCOM logbook)	-	20
Total		**100**	**100**

***Internal assessment examinations marks conversion to internal assessment marks - Theory** – Total 400 marks of Internal exams including Prelims will be converted to 80

Practical – Total 300 marks of Internal exams including Prelims will be converted to 60

Total Marks on Final Marksheet for the subject of Pathology will be

Theory	200 Mks
Practical	100 Mks
IA	200 Mks
TOTAL	**500 Mks**

Resolution No.3.1.2.3 of BOM-59/2019: The updated list of Text books and Reference books for 2nd MBBS (Microbiology, Pharmacology, Pathology, FMT) are approved. **[Annexure-8]**

(To be merged with syllabus i.e. Annexure-69 of BOM-57/2019 dt.26/04/2019)

Recommended books

Text Books

Sr. No.	Author	Title
1.	Robbins and Cotran	Pathologic basis of Disease
2.	Editors: Saxena Renu, Hara Prasad Pati, Mahapatra M.	De Gruchy's Clinical Haematology in Medical practice
3.	Harsh Mohan	Textbook of Pathology
4.	Harsh Mohan	Practical Pathology Book
5.	Dr. Vinay Kamal	Textbook of Pathology
6.	Dr. A.K. Mandal, Dr. Shramana Choudhury	Textbook of Pathology for MBBS (Volumes I and II)
7.	Sabitri Sanyal	Clinical Pathology: A Practical Manual Book
8.	Shirish M Kawthalkar	Essentials of Haematology
9.	Shirish M Kawthalkar	Essentials of clinical Pathology

Reference Books

Sr. No.	Author	Title
1.	Barbara Bain Imelda Bates Mike Laffan	Dacie and Lewis Practical hematology
2.	Fiona Roberts Elaine MacDuff	Pathology illustrated
3.	McPherson MD MSc, Richard A., Pincus, Matthew R.	Henry's Clinical Diagnosis and Management by Laboratory Methods
4.	R K Saran.	Transfusion medicine: technical manual
5.	Kalidas D. Chavan, Rajendra S. Bangal	Informed Consent In Medical Practice Principles And Conventions
6.	Ramdas Nayak	Exam Preparatory Manual for undergraduates

Item No. 4.4.2.1 of BOM-63/2021 (Item No. 3 of BOS): To develop electives related to Para-Clinical disciplines in accordance with Competency Based Medical Education (CBME) guidelines:

- 10 A:Virology and Bacteriology Techniques (Block 1): Microbiology (Navi Mumbai)
- 10 B:Biomedical Waste management (Block 1): Microbiology (Aurangabad)
- 10 C:Quality control in Hematology (Block 1): Pathology (Navi Mumbai)
- 10 D:Blood Banking (Block 2): Pathology (Aurangabad)
- 10 E:Good Laboratory Practices (Block 1): Pathology (Aurangabad)
- 10 F:Pharmacovigilance and Clinical Pharmacology (Block 1): Pharmacology (Navi Mumbai)
- 10 G:Examination & reporting of Injured Person (Block 1): FMT (Aurangabad)

Resolution No. 4.4.2.1.i of BOM-63/2021: Resolved to approve following Electives prepared as per the MCI (NMC) template for planning learning experiences: **[Annexure-37]**

- **10 A:Virology and Bacteriology Techniques** (Block 1): Microbiology (Navi Mumbai)
- **10 B:Biomedical Waste management** (Block 1): Microbiology (Aurangabad)
- **10 C:Quality control in Hematology** (Block 1): Pathology (Navi Mumbai)
- **10 D:Blood Banking** (Block 2): Pathology (Aurangabad)
- **10 E:Good Laboratory Practices** (Block 1): Pathology (Aurangabad)
- **10 F:Pharmacovigilance and Clinical Pharmacology** (Block 1): Pharmacology (Navi Mumbai and Aurangabad)
- **10 G:Examination and reporting of Injured Person** (Block 1): FMT (Aurangabad and Navi Mumbai)