Course Content
Second MBBS (from October 2020)
Subject: Pathology (Theory and Practical)

(Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 1; page nos.160-203)

1. Total Teaching hours : **230 hours**
2. A. Lectures (hours): **80**
   B. Self-directed learning (hours): **12**
   C. Clinical postings (hours): NIL
   D. Small group teachings/tutorials/Integrated teaching/Practicals (hours)**: 138**

Competency Nos.	Topics & Subtopics	Lectures	Small group teaching	SDL
		80 hours	**138 hours**	**12 hours**
PA1.1 – 1.3	**Introduction to Pathology** *Core*: common definitions and terms, role of pathologist, branches of pathology Practicals: histological techniques, working of a microscope *Non-core*: history and evolution of pathology	1	2	
PA2.1 – 2.8	**Cell injury and adaptations** *Core*: Cell injury, necrosis, apoptosis, intracellular accumulations, cell death, cellular adaptations, calcification, disorders of pigment metabolism, *Non-core*: cellular aging	6	6	
PA3.1-3.2	**Amyloidosis-** *Core*: Pathogenesis and pathology of amyloidosis	1	2	
PA4.1 – 4.4	**Inflammation** *Core*: Acute and chronic inflammation, mediators of inflammation, granulomatous inflammation, including TB	4	4	
PA5.1	**Healing and repair-** *Core*: Repair and wound healing	1	-	
PA6.1- 6.7	**Hemodynamic disorders** *Core*: Edema, hyperemia, congestion, hemorrhage, shock, thrombosis, embolism, ischemia, infarction	4	6	
PA7.1-7.5	**Neoplasia** *Core*: Definition and classification of neoplasia, molecular basis of cancer, carcinogenesis, effects of tumour on host, paraneoplastic syndrome, laboratory diagnosis of cancer *Non-core*: Immunology and immune response to cancer	5	6	
PA8.1-8.3	**Basic diagnostic cytology** *Core*: Diagnostic role of cytology, exfoliative cytology	-	2	
PA9.1-9.37	**Immunopathology** *Core*: Principles of immunity, hypersensitivity reactions, HLA system, transplant rejection, autoimmunity, systemic lupus erythematosus, pathology of HIV/AIDS	5	2	
PA10.1-10.4	**Infections and infestations-** *Core*: Malaria, cysticercus, leprosy, *Non-core:* Common bacterial, viral, protozoal, and helminthic diseases	-	2	1

Competency Nos.	Topics & Subtopics	Lectures	Small group teaching	SDL
		80 hours	138 hours	12 hours
PA11.1-11.3	**Genetic and pediatric diseases-** *Non-core*: Mutations, Tumors and tumour-like conditions of infancy and childhood, common storage disorders	1	-	1
PA12.1-12.3	**Environmental and nutritional disease** *Core*: Air pollution, tobacco, alcohol, protein calorie malnutrition, starvation, obesity	-	2	
PA13.1-13.5	**Introduction to hematology** *Core*: Hematopoiesis and extramedullary hematopoiesis, definition and classification of anemia, anticoagulants, investigations in anemia, peripheral smear examination	2	8	
PA14.1-14.3	**Microcytic anemia-** *Core*: Iron metabolism, microcytic hypochromic anemia, peripheral smear in microcytic anemia	1	4	
PA15.1-15.4	**Macrocytic anemia** *Core*: Vitamin B12 metabolism. Etiology and pathogenesis of B12 deficiency, laboratory investigations in macrocytic anemia, megaloblastic anemia *Non-core:* differences between megaloblastic and non-megaloblastic anemia	1	4	
PA16.1-16.7	**Hemolytic anemia** *Core:* Definition and classification of hemolytic anemia, pathogenesis, features, hematological indices, sickle cell anemia, thalassemia, peripheral smear picture in hemolytic anemia, classification, clinical features of hemolytic anemia	2	6	
PA17.1-17.2	**Aplastic anemia-** *Non-core*: Etiology, pathogenesis, findings, bone marrow aspiration and biopsy	1	2	
PA18.1-18.2	**Leukocyte disorders** *Core:* Leukocytosis, leukopenia, acute and chronic leukemia	2	2	
PA19.1-19.7	**Lymph node and spleen** *Core:* Lymphadenopathy, TB lymphadenitis, Hodgkin's disease, non-Hodgkin's lymphoma, splenomegaly	2	2	
PA20.1	**Plasma cell disorders-** *Core:* Multiple myeloma	-	2	
PA21.1-21.5	**Hemorrhagic disorders** *Core:* Normal hemostasis, vascular and platelet disorders, ITP, hemophilia, clotting disorders, DIC, Vitamin K deficiency	3	4	
PA22.1-22.7	**Blood banking and transfusion** *Core:* Blood group systems, compatibility testing, blood components, transfusion transmitted infections, transfusion reactions, autologous transfusion	2	4	1
PA23.1-23.3	**Clinical Pathology** *Core*: Urine analysis, Body fluids, semen analysis, thyroid function tests, renal function tests, liver function tests		12	
PA24.1-24.7	**Gastrointestinal tract:-** *Core*: Etiology, pathogenesis, pathology, morphology and clinical features of: oral cancer,	5	4	

Competency Nos.	Topics & Subtopics	Lectures	Small group teaching	SDL
		80 hours	138 hours	12 hours
	peptic ulcer disease, polyp, carcinoma stomach, tubercular intestine, inflammatory bowel disease, carcinoma colon			
PA25.1-25.6	**Hepatobiliary system:** *Core*: Bilirubin metabolism, etiopathogenesis and classification of jaundice, hepatic failure, pathology, complications, consequences and laboratory diagnosis of viral hepatitis; pathophysiology of alcoholic liver disease and cirrhosis; portal hypertension; hepatocellular carcinoma Interpretation of liver function tests; Serology panel in viral hepatitis (small group)	5	6	
PA26.1-26.7	**Respiratory system:** *Core*: Etiopathogenesis, morphology, and complications of: pneumonia, lung abscess, chronic obstructive airway disease, bronchiectasis, tuberculosis, occupational lung disease, lung tumours, *Non-core*: pleural tumours, mesothelioma	4	4	
PA27.1-27.10	**Cardiovascular system:** *Core*: Arteriosclerosis, aneurysm, heart failure, ischemic heart disease, laboratory diagnosis of acute coronary syndrome, rheumatic fever and heart disease, infective endocarditis, pericarditis, pericardial effusion, *Non-core*: cardiomyopathies,	5	6	1
PA28.1-28.16	**Urinary tract** *Core*: Histology of kidney, clinical syndromes, acute renal failure, chronic renal failure, acute glomerulonephritis, glomerular manifestations in systemic disease, diseases of tubular interstitium, acute tubular necrosis, acute and chronic pyelonephritis, reflux nephropathy, vascular diseases of kidney, cystic diseases of kidney, urinary calculi and obstructive uropathy, renal tumours *Non-core*: thrombotic angiopathies, urothelial tumours	6	4	2
PA29.1-29.5	**Male genital tract:** *Core*: Testicular tumours, carcinoma penis, benign prostatic hyperplasia, carcinoma prostate, *Non-core*: prostatitis	1	2	
PA30.1-30.9	**Female genital tract:** *Core*: Pathogenesis, etiology, pathology, diagnosis, and progression of: carcinoma cervix, carcinoma endometrium, leiomyoma, leiomyosarcoma, ovarian tumours, gestational trophoblastic neoplasms, *Non-core*: cervicitis, endometriosis, adenomyosis, endometrial hyperplasia	1	6	2
PA31.1-31.4	**Breast-** *Core*: Benign breast disease, carcinoma breast, *Non-core*: gynecomastia	1	2	
PA32.1-32.9	**Endocrine system** *Core*: etiology, pathogenesis, pathology and iodine dependency of: goiters, thyrotoxicosis, hyperthyroidism,	4	4	2

Competency Nos.	Topics & Subtopics	Lectures	Small group teaching	SDL
		80 hours	**138 hours**	**12 hours**
	hypothyroidism; epidemiology, etiopathogenesis, pathology, laboratory diagnosis, complications of diabetes mellitus *Non-core*: hyperparathyroidism, pancreatic cancer, adrenal insufficiency, Cushing syndrome, adrenal neoplasms			
PA33.1-33.5	**Bone and soft tissue** *Core:* Osteomyelitis, bone tumours, soft tissue tumors *Non-core*: Rheumatoid arthritis, Paget's disease of bone	1	4	1
PA34.1-34.4	**Skin** *Core*: Squamous cell carcinoma, basal cell carcinoma *Non-core*: Nevus, melanoma,	1	4	
PA35.1-35.3	**Central nervous system** *Core:* CSF findings in meningitis, CNS tumours	2	4	
PA36.1	**Eye-** *Non-core*: Retinoblastoma			1
AETCOM 2.4	**Working in a health care team**		2	
AETCOM 2.8	**What does it mean to be family member of a sick patient?**		2	

Subject: Pathology

LIST OF PRACTICALS

GENERAL PATHOLOGY

1. Histological techniques, tissue processing, microscopy
2. Intracellular accumulations, calcification
3. Cellular adaptations
4. Disorders of pigment metabolism
5. Amyloidosis
6. Acute inflammation
7. Chronic inflammation and repair
8. Tuberculosis and leprosy
9. Hemodynamic disturbances
10. Neoplasia
11. Infections and infestations

HEMATOLOGY

1. Collection of specimens, anticoagulants, normal hematopoiesis
2. Hemoglobin estimation: Interpretation of report
3. Hematocrit and Erythrocyte sedimentation rate: Interpretation of report
4. Complete blood count: Interpretation of report (without flags) from automated cell counter
5. Preparation of peripheral smear and performing differential leukocyte count, interpretation of peripheral smear
6. Investigations of anemia
7. Investigations of leukemia
8. Plasma cell dyscrasias
9. Investigation of bleeding and clotting disorders
10. Blood banking: Performing blood grouping and interpretation of results

SYSTEMIC PATHOLOGY

1. Lymphoma
2. Splenomegaly
3. Gastrointestinal tract: Ulcers
4. Intestinal polyp and carcinoma intestine
5. Cirrhosis and hepatocellular carcinoma
6. Pneumonia, bronchiectasis
7. Pulmonary tuberculosis and bronchogenic carcinoma
8. Atherosclerosis
9. Left ventricular hypertrophy, myocardial infarction, lab diagnosis of MI
10. Rheumatic heart disease and infective endocarditis
11. Chronic contracted kidney, glomerulonephritis, pyelonephritis
12. Urinary calculi, Renal cell carcinoma,
13. Male genital tract
14. Female genital tract: Carcinoma cervix, Carcinoma endometrium
15. Leiomyoma, Ovarian tumours
16. Gestational trophoblastic disease
17. Breast
18. Thyroid
19. Bone and soft tissue tumours
20. Skin
21. CNS tumours

CLINICAL PATHOLOGY

1. Urine analysis: Interpretation of physical, chemical and microscopic examination results
2. Semen analysis: Lecture demonstration, interpretation of report
3. Basic cytological techniques: FNAC and exfoliative cytology (Lecture demonstration)
4. CSF examination: Lecture demonstration and interpretation of reports
5. Body fluids: Interpretation of serous effusion reports
6. Interpretation of kidney function tests
7. Investigations in jaundice
8. Investigations in diabetes mellitus

AUTOPSY

Indications and technique, autopsy findings in common conditions like myocardial infarction, cirrhosis, portal hypertension, bronchogenic carcinoma, miliary tuberculosis, renal cell carcinoma etc.

Suggested LIST OF SPECIMENS

1. Fatty liver
2. Vesicular mole (hydropic change)
3. Cardiac hypertrophy
4. Kidney- atrophy
5. Large white kidney-amyloidosis
6. Anthracosis
7. Hemochromatosis- Prussian blue reaction
8. Acute appendicitis
9. Serofibrinous pericarditis
10. Abscess- lung/ liver
11. Tubercular lymph node- caseation, matted lymph nodes
12. CVC Liver
13. Splenic infarct
14. Renal infarct
15. Myocardial infarction
16. Leiomyoma
17. Squamous papilloma
18. Hemangioma- Liver
19. Intestinal polyp
20. Squamous cell carcinoma-skin/cervix/penis
21. Adenocarcinoma- intestine
22. Melanoma
23. Enlarged lymph node: Hodgkin's disease
24. Benign ulcer-Peptic ulcer
25. Tubercular intestine
26. Amebic ulcer
27. Malignant ulcer- Carcinoma stomach
28. Cirrhosis
29. Hepatocellular carcinoma
30. Pulmonary tuberculosis
31. Miliary tuberculosis
32. Rheumatic heart disease mitral stenosis
33. Small contracted kidney
34. Renal cell carcinoma
35. Hydronephrosis
36. Urinary calculi
37. Wilm's tumour

38. Carcinoma penis
39. Seminoma
40. Carcinoma cervix
41. Carcinoma endometrium
42. Dermoid cyst
43. Ovarian cystadenoma
44. Leiomyoma
45. Carcinoma breast
46. Goitre
47. Solitary thyroid nodule
48. Giant cell tumour
49. Fibroadenoma of breast
50. Lipoma
51. Metastatic (Liver/Lung)
52. Fat necrosis
53. Meningioma

LIST OF SLIDES

1. Cloudy swelling-kidney
2. Fatty liver
3. Hyaline change in leiomyoma
4. Benign prostatic hyperplasia
5. Squamous metaplasia
6. Calcification
7. Amyloidosis- kidney
8. Nevus
9. Anthracosis
10. Acute appendicitis
11. Acute pyogenic meningitis
12. Tubercular lymphadenitis (Caseous necrosis, granuloma)
13. Tuberculoid leprosy
14. Lepromatous leprosy
15. Pulmonary edema
16. CVC lung
17. CVC liver
18. Thrombus
19. Renal infarct
20. Myocardial infarction
21. Capillary hemangioma
22. Squamous papilloma
23. Squamous cell carcinoma
24. Adenocarcinoma
25. Actinomycosis
26. Rhinosporidiosis
27. Cysticercosis
28. PS-Malaria
29. Eosinophilia
30. Neutrophilia
31. Microcytic anemia
32. Macrocytic anemia
33. Sickle cell anemia
34. Acute leukemia

35. Chronic myeloid leukemia
36. Hodgkin's disease
37. Peptic ulcer
38. Tubercular intestine
39. Adenocarcinoma intestine
40. Cirrhosis
41. Lobar pneumonia
42. Bronchopneumonia
43. Pulmonary tuberculosis
44. Atherosclerosis
45. Myocardial infarction
46. Crescentic glomerulonephritis
47. Chronic pyelonephritis
48. Renal cell carcinoma
49. Benign prostatic hyperplasia
50. Seminoma
51. Fibroadenoma
52. Carcinoma breast
53. Colloid goiter
54. Papillary carcinoma thyroid
55. Basal cell carcinoma
56. Melanoma
57. Lipoma
58. Osteogenic sarcoma
59. Giant cell tumour

CASE-BASED LEARNING

1. Microcytic anemia
2. Macrocytic anemia
3. Hemolytic anemia
4. Multiple myeloma
5. Hepatitis
6. Obstructive jaundice
7. Hemolytic jaundice
8. Nephrotic syndrome
9. Meningitis

CHARTS

1. Interpretation of microcytic anemia
2. Interpretation of macrocytic anemia
3. Interpretation of hemolytic anemia
4. Interpretation of acute leukemia
5. Interpretation of chronic leukemia
6. Interpretation of multiple myeloma
7. Interpretation of bleeding disorder
8. Interpretation of clotting disorder
9. Interpretation of Liver disorders
10. Interpretation of Renal disorders
11. Interpretation of Thyroid disorders
12. Interpretation of acute myocardial infarction
13. Pyogenic meningitis
14. Tubercular meningitis
15. Viral meningitis
16. Diabetes mellitus

Paper wise distribution of topics for Prelim & MUHS Annual Examination
Year: Second MBBS
Subject: Pathology

Paper	Section	Topics
I	A	**Topics of the paper I**
		General Pathology: 1. Cell injury and adaptation 2. Amyloidosis 3. Inflammation and repair 4. Tuberculosis and leprosy 5. Hemodynamic disturbances 6. Immunopathology 7. Neoplasia 8. Infections and infestations 9. Basic diagnostic cytology 10. Histological techniques, tissue processing 11. Genetic and pediatric diseases 12. Environmental and nutritional diseases
		Hematology 1. Introduction to hematology 2. Microcytic anemia 3. Macrocytic anemia 4. Hemolytic anemia 5. Aplastic anemia 6. Leukocyte disorder 7. Lymph node and spleen 8. Plasma cell disorders 9. Hemorrhagic disorders 10. Blood banking and transfusion medicine
		AETCOM 2.4 and 2.8
II	A	**Topics of the paper II**
		Systemic Pathology 1. Gastrointestinal tract 2. Hepatobiliary system 3. Respiratory system 4. Cardiovascular system 5. Urinary tract 6. Male genital tract 7. Female genital tract 8. Breast 9. Endocrine system 10. Bone and soft tissue 11. Skin 12. Central nervous system
		Clinical Pathology 1. Urine analysis 2. Body fluid analysis 3. CSF analysis 4. Liver function test 5. Renal function test 6. Diabetes mellitus 7. Thyroid function test

Second MBBS
Internal Assessment
Subject: Pathology
Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Phase	IA – 1 -Exam (After 3 months , Jan)			IA – 2 -Exam (After 7 months, May)			Prelims (July)		
	Theory	Practical (Including 10 Marks for Journal & Log Book)	Total Marks	Theory	Practical Including 10 Marks for Journal & Log Book	Total Marks	Theory	Practical	Total Marks
Second MBBS	100	50	150	100	50	150	Paper 1 -100 Paper 2 -100	100	300

Assessment in CBME is ONGOING PRCESS,

No Preparatory leave is permitted.

1. There shall be 3 internal assessment examinations in Pathology.
2. The suggested patterns of question paper for first two internal assessment theory examinations can be similar to any of the two papers for final examination. Pattern of the prelims examinations should be similar to the University examinations.
3. Internal assessment marks for theory and practical will be converted to out of 40 (theory) + 40 (practical). Internal assessment marks, after conversion, should be submitted to university within the stipulated time as per directives from the University. **Conversion Formula for calculation of marks in internal assessment examinations.**

Phase II	Theory	Practical
IA 1	**100**	**50**
IA 2	**100**	**50**
Prelim	**200**	**100**
Total	**400**	**200**
Conversion out of	**40**	**40**
Conversion formula	**Total marks in 3 IA theory examinations /10**	**Total marks in 3 IA Practical examinations /5**
Eligibility criteria after conversion	**16**	**16**
	Combined theory + Practical = 40	

4. While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table.

Total Internal Assessment Marks	Final rounded marks
33.01 to 33.49	33
33.50 to 33.99	34

5. Students 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 order to be eligible for appearing at the final University examination of that subject.
6. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

7. Remedial measures

A. Remedial measures for non-eligible students

i) At the end of each internal assessment examination, students securing less than 50% marks shall be identified. Such students should be counseled at the earliest and periodically.
ii) Extra classes for such students may be arranged. If majority of the students found to be weak in a particular area then extra classes must be scheduled for all such students. Even after these measures, if a student is failed to secure 50% marks combined in theory and practical (40% separately in theory and practical) after prelim examination, the student shall not be eligible for final examination.
iii) Non eligible candidates are offered to reappear for repeat internal assessment examination/s, which must be conducted 2 months before next University examination. The pattern for this repeat internal assessment examination shall be similar to the final University examination. Only the marks in this examination shall be considered for deciding the eligibility criteria. Following conversion formula shall be used for converting the marks.

	Theory	Practical
Remedial examination (pattern as per final examination)	**200**	**100**
Conversion out of	**40**	**40**
Conversion formula	**Marks in remedial theory examinations /5**	**Marks in remedial Practical examinations /2.5**
Eligibility criteria after conversion	**16**	**16**
	Combined theory + Practical = 40	

B. <u>Remedial measures for absent students:</u>

If any of the students is absent for any of the 3 IA examinations due to any reasons, following measures shall be taken.

i. The student is asked to apply to the academic committee of the college for reexamination, through HOD, to ascertain the genuineness of the reason for absentee.

ii. If permitted by academic committee, an additional examination for such students is to be conducted after prelims examination. Marks for such additional examination shall be equal to the missed examination.

iii. Even if a student has missed more than one IA examination, he/she can appear for only one additional IA examination. In such scenario, eligibility should be determined by marks obtained in internal assessment examinations for which the candidate has appeared, without changing the denominator.

Second MBBS Practical Mark's Structure

Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Subject: Pathology (I.A. 1)											
Practical							Oral/Viva				Total
Seat No.											
	OSPE	PS/DLC	CBC report interpretation	Blood group	Histopathology slide	Total	Gross specimen General Pathology	Hematology		Log book	Practical & Oral
Max. Marks	10	5	5	5	5	30	7	8	15	5	50

Subject: Pathology (I.A. 2)									
Practical					Oral/Viva				Total
Seat No.									Practical & Oral
	OSPE	Urine report interpretation	Histopathology slide	Total	Gross specimen Systemic Pathology	Clinical pathology	Total	Log book	Total
Max. Marks	20	5	5	30	7	8	15	5	50

Subject: Pathology Prelim Examination

	Practical								Oral/Viva			
Seat No.											Total	Practical & Oral
	OSPE	PS/DLC	Urine interpretation	CBC report interpretation	Blood group	Histopathology slide	Logbook	Total	Gross specimens	Clinical and hematology	Total	Total (G +)
Max. Marks	32	10	10	5	5	8	10	80	10	10	20	100

Subject: Pathology M.U.H.S. Final Exam.

	Practical							Oral/Viva			
Seat No.							Total			Total	Practical & Oral
	OSPE	PS/DLC	Urine interpretation	CBC report interpretation	Blood group	Histopathology slide		Gross specimens	Clinical and hematology	Total	Total (G + J)
	A	B	C	D	E	F	G	H	I	J	K
Max. Marks	32	10	10	5	5	8	70	15	15	30	100

For Urine examination

Students are not expected to perform urine examination, but to interpret results. Clinical cases with urinary findings may be given to them for interpretation.

Suggested OSPE stations

1. Clinical chart interpretation (Clinical Pathology) - 5 marks
2. Clinical chart interpretation (Clinical Pathology) - 5 marks
3. Clinical chart interpretation (CSF) - 5 marks
4. Clinical chart interpretation (Hematology)- 5 marks
5. Slides (3)- Hematology, benign, inflammatory- 6 marks
6. Specimens (3)- 6 marks

Subject: Pathology

LIST OF PRACTICALS

GENERAL PATHOLOGY

1. Histological techniques, tissue processing, microscopy
2. Intracellular accumulations, calcification
3. Cellular adaptations
4. Disorders of pigment metabolism
5. Amyloidosis
6. Acute inflammation
7. Chronic inflammation and repair
8. Tuberculosis and leprosy
9. Hemodynamic disturbances
10. Neoplasia
11. Infections and infestations

HEMATOLOGY

1. Collection of specimens, anticoagulants, normal hematopoiesis
2. Hemoglobin estimation: Interpretation of report
3. Hematocrit and Erythrocyte sedimentation rate: Interpretation of report
4. Complete blood count: Interpretation of report (without flags) from automated cell counter
5. Preparation of peripheral smear and performing differential leukocyte count, interpretation of peripheral smear
6. Investigations of anemia
7. Investigations of leukemia
8. Plasma cell dyscrasia
9. Investigation of bleeding and clotting disorders
10. Blood banking: Performing blood grouping and interpretation of results

SYSTEMIC PATHOLOGY

1. Lymphoma
2. Splenomegaly
3. Gastrointestinal tract: Ulcers
4. Intestinal polyp and carcinoma intestine
5. Cirrhosis and hepatocellular carcinoma
6. Pneumonia, bronchiectasis
7. Pulmonary tuberculosis and bronchogenic carcinoma
8. Atherosclerosis
9. Left ventricular hypertrophy, myocardial infarction, lab diagnosis of MI
10. Rheumatic heart disease and infective endocarditis
11. Chronic contracted kidney, glomerulonephritis, pyelonephritis
12. Urinary calculi, Renal cell carcinoma,
13. Male genital tract
14. Female genital tract: Carcinoma cervix, Carcinoma endometrium
15. Leiomyoma, Ovarian tumours
16. Gestational trophoblastic disease
17. Breast
18. Thyroid
19. Bone and soft tissue tumours
20. Skin
21. CNS tumours

CLINICAL PATHOLOGY

1. Urine analysis: Interpretation of physical, chemical and microscopic examination results
2. Semen analysis: Lecture demonstration, interpretation of report
3. Basic cytological techniques: FNAC and exfoliative cytology (Lecture demonstration)
4. CSF examination: Lecture demonstration and interpretation of reports
5. Body fluids: Interpretation of serous effusion reports
6. Interpretation of kidney function tests
7. Investigations in jaundice
8. Investigations in diabetes mellitus

AUTOPSY

Indications and techniques, autopsy findings in common conditions like myocardial infarction, cirrhosis, portal hypertension, bronchogenic carcinoma, miliary tuberculosis, renal cell carcinoma etc.

LIST OF SPECIMENS

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2. Vesicular mole (hydropic change)
3. Cardiac hypertrophy
4. Kidney- atrophy
5. Large white kidney-amyloidosis
6. Anthracosis
7. Hemochromatosis- Prussian blue reaction
8. Acute appendicitis
9. Serofibrinous pericarditis
10. Abscess- lung/ liver
11. Tubercular lymph node- caseation, matted lymph nodes
12. CVC Liver
13. Splenic infarct
14. Renal infarct
15. Myocardial infarction
16. Leiomyoma
17. Squamous papilloma
18. Hemangioma- Liver
19. Intestinal polyp
20. Squamous cell carcinoma-skin/cervix/penis
21. Adenocarcinoma- intestine
22. Melanoma
23. Enlarged lymph node: Hodgkin’s disease
24. Benign ulcer-Peptic ulcer
25. Tubercular intestine
26. Amebic ulcer
27. Malignant ulcer- Carcinoma stomach
28. Cirrhosis
29. Hepatocellular carcinoma
30. Pulmonary tuberculosis
31. Miliary tuberculosis
32. Bronchectasis
33. Bronchogenic carcinoma
34. Atherosclerosis
35. Myocardial infarction

36. Small contracted kidney
37. Renal cell carcinoma
38. Hydronephrosis
39. Urinary calculi
40. Wilm's tumour
41. Carcinoma penis
42. Seminoma
43. Carcinoma cervix
44. Carcinoma endometrium
45. Dermoid cyst
46. Ovarian cystadenoma
47. Leiomyoma
48. Carcinoma breast
49. Goitre
50. Solitary thyroid nodule
51. Giant cell tumour
52. Fibroadenoma of breast
53. Lipoma
54. Metastasis of Liver/Lung
55. Fat necrosis
56. Meningioma

LIST OF SLIDES

1. Cloudy swelling-kidney
2. Fatty liver
3. Hyaline change in leiomyoma
4. Benign prostatic hyperplasia
5. Squamous metaplasia
6. Calcification
7. Amyloidosis- kidney
8. Nevus
9. Anthracosis
10. Acute appendicitis
11. Acute pyogenic meningitis
12. Tubercular lymphadenitis (Caseous necrosis, granuloma)
13. Tuberculoid leprosy
14. Lepromatous leprosy
15. Pulmonary edema
16. CVC lung /Liver
17. Thrombus
18. Renal infarct
19. Myocardial infarction
20. Capillary hemangioma
21. Squamous papilloma
22. Squamous cell carcinoma
23. Adenocarcinoma
24. Actinomycosis
25. Rhinosporidiosis
26. Cysticercosis
27. PS-Malaria

28. Eosinophilia
29. Neutrophilia
30. Microcytic anemia
31. Macrocytic anemia
32. Sickle cell anemia
33. Acute leukemia
34. Chronic myeloid leukemia
35. Hodgkin's disease
36. Peptic ulcer
37. Tubercular intestine
38. Adenocarcinoma intestine
39. Cirrhosis
40. Lobar pneumonia
41. Bronchopneumonia
42. Pulmonary tuberculosis
43. Atherosclerosis
44. Myocardial infarction
45. Crescentic glomerulonephritis
46. Chronic pyelonephritis
47. Renal cell carcinoma
48. Benign prostatic hyperplasia
49. Seminoma
50. Fibroadenoma
51. Carcinoma breast
52. Colloid goiter
53. Papillary carcinoma thyroid
54. Basal cell carcinoma
55. Melanoma
56. Lipoma
57. Osteogenic sarcoma
58. Giant cell tumour

CASE-BASED LEARNING

1. Microcytic anemia
2. Macrocytic anemia
3. Hemolytic anemia
4. Multiple myeloma
5. Hepatitis
6. Obstructive jaundice
7. Hemolytic jaundice
8. Nephrotic syndrome
9. Meningitis

CHARTS

1. Interpretation of microcytic anemia
2. Interpretation of macrocytic anemia
3. Interpretation of hemolytic anemia
4. Interpretation of acute leukemia
5. Interpretation of chronic leukemia

6. Interpretation of multiple myeloma
7. Interpretation of bleeding disorder
8. Interpretation of clotting disorder
9. Interpretation of Liver disorders
10. Interpretation of Renal disorders
11. Interpretation of Thyroid disorders
12. Interpretation of acute myocardial infarction
13. Pyogenic meningitis
14. Tubercular meningitis
15. Viral meningitis
16. Diabetes mellitus

f. Books recommended:

a) Text book of Pathology by Robbins
b) Text book of General Pathology Part I & II by Bhende and Deodhare c) Clinical Pathology by Talib
d) Text book of Pathology by Harsh Mohan e) Text book of Pathology by Muir
f) Haematology De Gruchi
g) IAPM text book of Pathology

Reference books:

a) Anderson's text book of Pathology Vol I & II
b) Oxford text book of Pathology Vol. I, II & III
c) Pathology by Rubin and Farber
d) Pathologic basis of Disease Robbins

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year	:	**Second MBBS** *(applicable w.e.f. September 2021 & onwards examinations)*				2. Subject Code	:
3. Subject (PSP)	:	**PATHOLOGY**					
(TT)	:						
4. Paper :	:	**I**	5. Total Marks : **100**	6. Total Time : 3 Hrs.		7. Remu. (Rs)	: Rs. 300/-
						8. Remu. (Rs)	: Rs. 350/-
9. Web Pattern	: [ ]	10. Web Skeleton	: [ ]	11. Web Syllabus	: [ ]	12. Web Old QP	: [ ]

Instructions:

SECTION "A" MCQ

1) *Put in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each. At least 5 should be scenario-based MCQ) (20 x1=20)

a)	b)	c)	d)	e)	f)	g)	h)	i)	j)
k)	l)	m)	n)	o)	p)	q)	r)	s)	t)

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answerbook for all sections.*

2. SAQ - AETCOM Module (2.4 and 2.8) (7x1=7)

a)

3. Short Answer Questions (Any 3 out of 4) (7x3=21)

a) b) c) d)

4. Long Answer Questions (Structured) (12x1=12)

a)

5 Short answer questions (Any 4 out of 5) (7x4=28)

a) b) c) d) e)

6 Long Answer Questions (Structured) (12x1=12)

a)

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year : **Second MBBS** *(applicable w.e.f. September 2021 & onwards examinations)*						2. Subject Code :	
3. Subject (PSP) : **PATHOLOGY**							
(TT) :							
4. Paper : : **II**	5. Total Marks : **100**		6. Total Time : 3 Hrs.			7. Remu. (Rs) :	Rs. 300/-
						8. Remu. (Rs) :	Rs. 350/-
9. Web Pattern : [ ]	10. Web Skeleton : [ ]		11. Web Syllabus : [ ]			12. Web Old QP :	[ ]

Instructions:

SECTION "A" MCQ

1) *Put in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each. At least 5 should be scenario-based MCQ) (20 x1=20)

a)	b)	c)	d)	e)	f)	g)	h)	i)	j)
k)	l)	m)	n)	o)	p)	q)	r)	s)	t)

SECTION "B" & "C"

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answerbook for all sections.*

2. Short Answer Questions (Any 4 out of 5) (7x4=28)

a) b) c) d) e)

3. Long Answer Question Structured (12x1=12)

a)

4 Short answer question (Any 4out of 5) (7x4=28)

b) b) c) d) e)

(12x1=12)

5 Long Answer Questions (Scenario Based)

a)

Competency Based Medical Education

Year: Second MBBS

Subject: *Pathology Learning Resource Material*

Books recommended:

a)Text book of Pathology by Robbins
b)Text book of General Pathology Part I & II by Bhende and Deodhare
c)Clinical Pathology by Talib
d)Text book of Pathology by Harsh Mohan
e)Text book of Pathology by Muir
f)Haematology De Gruchi
g)IAPM text book of Pathology

Reference books:

a)Anderson's text book of Pathology Vol I & II
b)Oxford text book of Pathology Vol. I, II & III
c)Pathology by Rubin and Farber
d)Pathologic basis of Disease Robbins

PATHOLOGY LOGBOOK FOR PHASE SECOND MBBS STUDENTS AS PER COMPETENCY BASED CURRICULUM

Preface

The Medical Council of India has revised the undergraduate medical education curriculum so that the Indian Medical Graduate (IMG) is able to recognize **"Health for all"** as a national goal. He/she should also be able to fulfil his/her societal obligations. The revised curriculum has specified the competencies that a student must attain and clearly defined teaching-learning strategies for the same. With this goal in mind, integrated teaching, skill development, AETCOM and self-directed learning have been introduced. There would be emphasis on communication skills, basic clinical skills and professionalism. There is a paradigm shift from the traditional didactic classroom-based teaching to learning environments where there is emphasis on learning by exploring, questioning, applying, discussing, analysing, reflecting, collaborating and doing. The recognition of this need is enshrined by a greatly enhanced allocation of time to these methods and also the assessment techniques. With this view in mind the log book has been designed as per the guidelines of competency based curriculum.

Name of the College

_____

Admission Year: _____

CERTIFICATE

This is to certify that,

Mr/Ms._____

Roll No. _____ has satisfactorily attended/completed all assignments mentioned in this logbook as per the guidelines prescribed by Medical Council of India, for Phase II MBBS Competency Based Curriculum in the subject of Pathology.

Date: ___/___/_____

Place: _____

Teacher Incharge

Professor and Head
Department of Pathology

Instructions

1. This logbook is prepared as per the guidelines of MCI for implementation of Competency based curriculum for Phase II MBBS students in the subject of Pathology.
2. Students are instructed to keep their logbook entries up to date.
3. Students also have to write reflections on AETCOM Module 2.4 and 2.8)
   Reflections should be structured using the following guiding questions:
   - What happened? (What did you learn from this experience)
   - So what? (What are the applications of this learning)
   - What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)
4. The logbook assessment will be based on multiple factors like
   - Attendance
   - Active participation in the sessions
   - Timely completions
   - Quality of write up of reflections
   - Overall presentation

CONTENTS

S.No	Topic	Signature of the teacher	Remarks

S.No	Topic	Signature of the teacher	Remarks

S.No	Topic	Signature of the teacher	Remarks

ASSESSMENT OF LOG BOOK

Sr.No	Description	Maximum Marks	Marks obtained	Signature of Teacher
1	**Completion of Journal- I term**	5		
2	**Completion of Journal- II term**	5		
3	**Performance in case based learning**	3		
4	**Participation in seminars, research projects, quiz etc**	3		
5	**Reflections on AETCOM Module** *** 2.4 , 2.8**	2		
6	**Attendance Records**	2		
7	**Total marks obtained for log book**	20		

* AETCOM – Competencies for IMG, 2018, Medical Council of India.

The following skills have been performed by the student and are certified by the teacher as follows:

		Date	Teacher's signature
1.	Preparation of peripheral smear		
2.	Interpretation of liver function tests and viral serology panel		
3	Interpretation of CSF in meningitis		

PRACTICAL TOPICS IN PATHOLOGY

Students are expected to write briefly about the topics and draw labelled diagrams of relevant slides in their journal, and get it assessed from their teacher.

GENERAL PATHOLOGY

1. Histological techniques, tissue processing, microscopy
2. Intracellular accumulations, calcification
3. Cellular adaptations
4. Disorders of pigment metabolism
5. Amyloidosis
6. Acute inflammation
7. Chronic inflammation and repair
8. Tuberculosis and leprosy
9. Hemodynamic disturbances
10. Neoplasia
11. Infections and infestations

HEMATOLOGY

1. Collection of specimens, anticoagulants, normal hematopoiesis
2. Hemoglobin estimation: Interpretation of report
3. Hematocrit and Erythrocyte sedimentation rate: Interpretation of report
4. Complete blood count: Interpretation of report (without flags) from automated cell counter
5. Preparation of peripheral smear and performing differential leukocyte count, interpretation of peripheral smear
6. Investigation of anemia
7. Investigation of leukemia
8. Plasma cell dyscrasia
9. Investigation of bleeding and clotting disorders
10. Blood banking: Performing blood grouping and interpretation of results

SYSTEMIC PATHOLOGY

1. Lymphoma
2. Splenomegaly
3. Gastrointestinal tract: Ulcers
4. Intestinal polyp and carcinoma intestine
5. Cirrhosis and hepatocellular carcinoma
6. Pneumonia, bronchiectasis
7. Pulmonary tuberculosis and bronchogenic carcinoma
8. Atherosclerosis
9. Left ventricular hypertrophy, myocardial infarction, lab diagnosis of MI
10. Rheumatic heart disease and infective endocarditis
11. Chronic contracted kidney, glomerulonephritis, pyelonephritis
12. Urinary calculi, Renal cell carcinoma,
13. Male genital tract
14. Female genital tract: Carcinoma cervix, Carcinoma endometrium
15. Leiomyoma, Ovarian tumours
16. Gestational trophoblastic disease
17. Breast
18. Thyroid

19. Bone and soft tissue tumours
20. Skin
21. CNS tumours

CLINICAL PATHOLOGY

1. Urine analysis: Interpretation of physical, chemical and microscopic examination results
2. Semen analysis: Lecture demonstration, interpretation of report
3. Basic cytological techniques: FNAC and exfoliative cytology (Lecture demonstration)
4. CSF examination: Lecture demonstration and interpretation of reports
5. Body fluids: Interpretation of serous effusion reports
6. Interpretation of kidney function tests
7. Investigations in jaundice
8. Investigations in diabetes mellitus

AUTOPSY

Indications and techniques, autopsy findings in common conditions like myocardial infarction, cirrhosis, portal hypertension, bronchogenic carcinoma, miliary tuberculosis, renal cell carcinoma etc.

Reflection on AETCOM 2.4

Topic: Working in a health care team **Date:**

Signature of Teacher-in- charge

Reflection on AETCOM 2.8

Topic: What does it mean to be a family member of a sick patient? Date:

Signature of Teacher-in- charge

Participation in Seminars, Research Projects, Quiz

S.No	Activity	Date	Signature of Teacher

Signature of Teacher-in- charge

Details of attending extra classes [For poor attendance (if any)]

S.No	Date	Period	Total hrs	Signature of student	Signature of Teacher
Total hours					

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.