



GENERAL PATHOLOGY & MICROBIOLOGY STUDY GUIDE FOR 3RD YEAR MBBS SESSION 2022

This Study guide of the course outlines the key components and areas for the facilitation of the students

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Introduction to Study Guide

This study guide is designed by a consolidated effort of all the faculty members throughout the year to provide MBBS students of CMH Lahore Medical College a resource material which would highlight important aspects of the curriculum. The study guide aims to promote self-regulated lifelong learning among students.

The curriculum aspects of undergraduate's competencies, assessment policies and curriculum coordinators are mapped in this guide book.

The study guide gives an overview of intended course outcomes and objectives in relation to the course content. The assessment methodology tailored to institutional strategy is provided.

This study guide has been carefully designed, keeping in view PM&DC and NUMS curriculum and guidelines. Dedicated effort by faculty has been done to make this guide tailored to student's needs. This humble effort of all faculty acts as a beacon of light for our dear students.

Mission Statement (College)

To provide an excellent learning and teaching environment, inculcating ethical values and social responsibilities in undergraduate and postgraduate medical & dental students and nursing and allied health sciences students to enhance the level of comprehension healthcare in the Army/Country.

Vision Statement (NUMS)

To ensure the development and sustenance of internationally acclaimed quality standards and practices for NUMS Higher Education that benefits and lives up to the stakeholder's needs and expectation.

Introduction To General Pathology And Microbiology

The subject of General Pathology and Microbiology at an undergraduate level enables the students to recognize the structural and functional causes of human disease. The four aspects of a disease process that form the core of pathology are: the cause of a disease (etiology), the mechanisms of disease development (pathogenesis), the structural and biochemical alterations induced in cells and tissues by the disease (morphologic & biochemical changes) and the functional consequences of the morphologic and molecular changes (clinical significance).

Teaching & Learning Distribution Year-III:	36 weeks
First Module:	12 weeks
Second Module:	12 weeks
Third Module:	12 weeks
Contact hours for Pathology:	260 hours

COURSE OUTLINE

MODULE- I				
DURATION: 12 WEEKS				
By the end of Block I, the students will be able to:				
S No	Theme/Block	Learning Outcomes	Course Content	% Weig htag e
1	Cell Injury, Cell death & Adaptations	<ul style="list-style-type: none"> • Correlate the mechanism of different types of pathological cellular adaptations with the micro and macroscopic structure • Critically analyze the pathological basis of apoptosis • Compare different types of necrosis • Relate the genetic aspects of aging with its current theories • Correlate ischemic changes to its morphology • Relate different types of cellular accumulations with the pathological basis of disease • Differentiate between reversible and irreversible cell injury. (definition, causes, morphology, mechanism, examples) 	<ul style="list-style-type: none"> • Introduction to Pathology • Cellular adaptations • Ischemia & cell injury • Mechanisms of cell injury • Cellular aging • Necrosis & apoptosis • Intracellular accumulations 	20
2	Inflammation and wound healing	<ul style="list-style-type: none"> • Differentiate between acute and chronic inflammation on the basis of etiology, pathogenesis and morphology • Summarize the systemic effects of inflammation with the variants of tissue repair 	<ul style="list-style-type: none"> • Acute Inflammation • Chemical Mediators • Chronic inflammation • Specific types of chronic inflammation • Wound healing & tissue repair 	20

3	Hemodynamic disorders, thromboembolism and shock	<ul style="list-style-type: none"> • Assess the hemodynamic disorders including hyperemia, congestion and edema along with the pathogenesis and contributing factors (thrombosis and embolism). • Describe the pathological factors involved in the process of infarction and shock along with their types. 	<ul style="list-style-type: none"> • Edema, hyperemia & congestion • Thrombosis • Embolism • Hemorrhage • Shock • Infarction • Amyloidosis 	20
	General Microbiology	<ul style="list-style-type: none"> • Correlate the basic morphological, physiological and genetic characteristics of bacteria with their pathological mechanism • Match the members of normal flora with their appropriate anatomical locations • Appraise the concept and different methods of sterilization and disinfection in detail. • Apply the methods of health professional and patient safety in laboratory and clinical settings. (infection control measures) • Outline the mechanism of bacterial resistance to antibiotics. 	<ul style="list-style-type: none"> • Introduction to microbiology and biohazards in microbiology lab and infection control measures • Bacterial anatomy, physiology, bacterial growth and genetics • Sterilization and disinfection by physical methods • Sterilization and disinfection by chemical methods • Bacterial pathogenesis • Normal Flora 	20

5	<p>Special Bacteriology</p> <p>(Gram positive cocci , Gram-negative cocci and Gram negative rods)</p>	<ul style="list-style-type: none"> • Correlate the important morphological and pathogenic characteristics, laboratory diagnosis, prevention and virulence factors produced by gram positive cocci, gram-negative cocci with their clinical significance • Describe the important morphological, pathogenic characteristics, laboratory diagnosis and virulence factors produced by gram negative cocci • Describe the important morphological, pathogenic characteristics, laboratory diagnosis, clinical findings and virulence factors produced by Enterobacteriaceae, Non-Enterobacteriaceae, zoonotic and respiratory Gram-negative rods 	<ul style="list-style-type: none"> • Gram positive cocci and gram negative bacteria Staphylococci • Antibiotics resistance mechanism • Streptococci, classification and Streptococcus pyogenes • Streptococcus pneumoniae • Other streptococci and enterococci • Neisseria meningitidis • Neisseria gonorrhoeae • Coliform organisms & family Enterobacteriaceae: General characteristics • E. coli, Klebsiella, Enterobacter, Proteus, Providentia and Morganella • Salmonella • Shigella • Vibrio • Pseudomonas • Haemophilus • Bordetella, Legionella • Campylobacter, Helicobacter • Brucella, Pasteurella, Yersinia 	20
				100
	<p>End Block Assessment</p>	<p>Assessment tools: MCQs & SAQs/SEQs</p>		

MODULE- I			
DURATION: 12 WEEKS		Practical Topics	
S No	THEME	LEARNING OUTCOMES	%
1	Study of microscope	Correlate the different parts of the microscope with their function. Identify the types of lenses, their power (low power, high power and oil immersion) and their magnification.	05
2	Gram stain	Differentiate between Gram positive and Gram-negative bacteria. Perform Gram staining technique and express the principle. Identify the slide. Enumerate Gram positive and Gram-negative organism. Interpret results of Gram stain. List causes false Gram positive and Gram-negative staining.	10
3	ZN stain	Express the principal of ZN Staining. Perform ZN Staining Interpret result of staining. Enumerate acid fast bacteria.	10
4	Culture media	Classify culture media. Identify culture media and outline their important characteristics. Match organisms with the media on which they are cultured. Indicate why different organisms need different culture media and have different growth requirements	10
5	Identification of Bacteria	Classify bacteria Identify bacteria in laboratory by biochemical tests, catalase test, coagulase test, oxidase test, sugar utilization, motility and microscopy Outline the principle of test used for bacterial identification.	05
6	Hyperplasia	Define Hyperplasia Enumerate causes of hyperplasia Identify the slide in endometrial hyperplasia and morphological changes	05

8	Metaplasia	Define metaplasia Categorize types of Metaplasia and assess its causes Identify the slide of metaplasia	05
9	Hydropic Change	Define hydropic change and cellular swelling / vacuolar degeneration. Explain the causes of hydropic changes. Identify the morphology and Microscopic appearance of hydropic changes	05
10	Fatty Change	Definition of fatty change. Describe the causes of fatty changes. Identify the fatty changes in liver on the slide	05
11	Calcification	Define calcification. Enumerate various causes and types of calcification Identify the slide of calcification.	05
12	Intracellular accumulation (melanin, hemosiderin)	Illustrate the substances that accumulate in the living matter. Explain the various types of pigments Identify the slide of malignant melanoma.	05
13	Coagulative Necrosis	Define coagulative necrosis Identify the slides of coagulative necrosis in kidney. Outline the important characteristics.	05
14	Caseous Necrosis	Define caseous necrosis. Identify the slides of caseous necrosis. Outline the important characteristics.	05
15	Acute inflammation	Define acute inflammation Describe various types and causes of acute inflammation Identify the slide of acute appendicitis.	05
16	Chronic inflammation	Define chronic inflammation. Describe the causes and types of chronic inflammation Identify the slides of chronic cholecystitis.	05
17	Chronic granulomatous inflammation	Describe the concept of granulomatous inflammation and granuloma formation. Assess various chronic granulomatous infections that are important clinically. Identify granuloma on slide microscopically.	05
			100

MODULE- II				
DURATION: 12 WEEKS				
S No	Theme/Block	Learning Outcomes	Course Content	% Weig htag e
1	Genetic and pediatric disease	<ul style="list-style-type: none"> • Evaluate the nature and pattern of inheritance disorders involving single and multiple gene complex. • Relate the congenital anomalies infections and syndrome. 	<ul style="list-style-type: none"> • Introduction to genetics, biochemical & molecular basis of Mendelian disorder • Multifactorial disorders • Cytogenetic disorders • Diagnosis of genetic disorders 	20
2	Disease of immune system	Categorize and evaluate the components of normal immune system along with various pathological immune response Evaluate the autoimmune diseases with various types of immunodeficient syndromes	<ul style="list-style-type: none"> • Immune system, complement system, immunoglobulin • Hypersensitivity I,II,III & IV • HLA system • Tissue transplantation, tolerance & autoimmunity • Autoimmune disease • Immune deficiency syndrome, AIDS • Lab diagnosis of immunological diseases 	30

3	Special Bacteriology (GPR, Mycobacteria, Mycoplasma, Spirochetes, Chlamydia, Rickettsia and miscellaneous bacteria)	<ul style="list-style-type: none"> Describe the important morphological, pathogenic characteristics, laboratory diagnosis, virulence factors and clinical findings produced by Enterobacteriaceae, Non-Enterobacteriaceae, zoonotic and respiratory gram-negative rods State the laboratory diagnosis, pathogenesis and drug sensitivity of Tuberculosis Categorize the clinical diseases caused by Atypical Mycobacteria. Outline pathophysiological basis and diagnosis of leprosy Describe the important morphological, pathogenic characteristics, laboratory diagnosis and virulence factors produced by gram positive rods, mycoplasma, spirochetes, chlamydia, rickettsia and miscellaneous* bacteria 	Gram positive rods <ul style="list-style-type: none"> Corynebacterium Clostridia Bacillus Listeria Actinomyces & Nocardia Mycobacteria <ul style="list-style-type: none"> M. tuberculosis M. leprae Atypical mycobacteria Mycoplasma Spirochetes Chlamydia Rickettsia and Anaerobes, and other minor bacterial pathogens	20
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4	Virology	<ul style="list-style-type: none"> Differentiate classes of viruses Outline the diagnosis and pathogenesis of viruses Paraphrase the Pathophysiology, laboratory diagnosis, and prevention of Hepatitis, Polio and Rabies Outline the causes and clinical features of important viral diseases** 	Classification of viruses and principles of viral diagnosis <ul style="list-style-type: none"> RABIES HEPATITIS VIRUSES Polio virus Herpes viruses HIV/AIDS Measles, mumps and rubella Herpes viruses VHF tumor viruses Rotavirus, norovirus and other important viruses Papilloma viruses 	30
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		Miscellaneous*	Anaerobes, and other minor bacterial pathogens	
		important viral diseases**	(Herpesviruses, HIV, RNA enveloped and unenveloped viruses, Agents of VHF, tumor viruses, HPV, adenoviruses, arbovirus)	
				100
	End Block Assessment	Assessment tools: MCQs & SAQs/SEQs		

MODULE- II			
DURATION: 10 WEEKS		Practical Topics	
S No	THEME	LEARNING OUTCOMES	%
1	Motility testing	Perform motility testing. Recall the principle of motility test. Distinguish between organisms which are motile and those which are non-motile. Indicate the different methods of detecting motility.	10
2	Oxidase test	Perform the test. Paraphrase the principle of oxidase test. List organisms which are oxidase positive and oxidase negative.	10
3	Catalase test	Define the Principle of catalase test Perform the test. List catalase positive and negative organism and outline their important characteristics.	10
4	Biochemical Tests	Relate the principle of various biochemical tests with the interpretation of results. Identify various bacteria on the basis of color change on these biochemical tests.	10
5	Urine R.E.	Paraphrase the urine collection technique with special emphasis on clean catch mid-stream urine (MSU) and its significance. Identify the methods used to preserve urine sample in case of delay. Perform the test. Interpret the result of Urine R.E. and correlate with the pathology Correlate clinically the results of Urine R.E.	10
6	Hyperemia / congestion	Define chronic venous congestion. Identify venous congestion on gross examination of liver and lung specimen Identify the slide of liver and lung with chronic venous congestion.	10
7	Edema Lung / Liver	Define and assess edema Differentiate between transudative and exudative types. Identify edema on gross examination of lung specimen. Identify typical changes microscopically and know about “Heart Failure Cells” on the slide of lung edema	10

8	Thrombus (coronary)	Differentiate between thrombi and post mortem clots. Identify thrombus on microscopic examination.	10
9	Infarction (Myocardial)	Define infarction along with various types of necrosis Identify infarcted area on gross examination Identify the slide of infarction	10
10	Amyloidosis	Define amyloid (Fibrin + Proteins) Illustrate the classification of amyloidosis and different types of proteins making amyloid Recommend the different stains used to differentiate amyloid from other deposits. Identify amyloidosis effected organs on gross examination Identify the slide of amyloidosis	10
			100 %

MODULE- III				
DURATION: 12 WEEKS				
S No	Theme/Block	Learning Outcomes	Course Content	% Weightage
1	Neoplasia	<ul style="list-style-type: none"> Analyze the nomenclature, characteristic, epidemiology, carcinogenesis, grading and staging, genetic basis, and mechanism of metastasis 	Introduction <ul style="list-style-type: none"> Carcinogenesis Pathogenesis of tumors Mechanism of spread of malignant tumor Clinical features of tumor & lab diagnosis 	30
2	Environmental and nutritional disease	<ul style="list-style-type: none"> Justify the environmental and nutritional factors contributing in diseases and effects. 	Environmental diseases <ul style="list-style-type: none"> Harmful effects of smoking, radiation and alcohol 	10
3	Mycology	<ul style="list-style-type: none"> Identify, classify and diagnose various fungi along with their clinical relevance 	<ul style="list-style-type: none"> Superficial Mycoses (Dermatophytes) Subcutaneous Mycoses (Sporothrix) Systemic Mycoses (Histoplasma, Coccidioides, Paracoccidioides and Blastomyces) Opportunistic pathogenic fungi (Candida, Aspergillus, Cryptococcus, Rhizopus, Mucor and other minor opportunistic fungi)	10

4	Parasitology	<ul style="list-style-type: none"> Identify and classify various parasites Distinguish the life cycle, pathogenesis and laboratory diagnosis of parasites 	Introduction to parasitology <ul style="list-style-type: none"> Entamoeba histolytica Giardia lamblia Trichomonas vaginalis Cryptosporidium Malaria Toxoplasma gondii, Leishmania Trypanosomes Cestodes-I & II Trematodes (Introduction and Schistosomes) Ascaris lumbricoides Enterobius vermicularis Ancylostoma/ Necator Trichuris Trichinella Strongyloides Tissue nematodes Spread of parasites and its prevention 	30
5	Infectious diseases /syndromes	<ul style="list-style-type: none"> Diagnose (differential and laboratory) and manage infectious diseases and name their possible causative agents 	<ul style="list-style-type: none"> Respiratory tract infection Meningitis STDs Urinary tract infections Diarrhea/Dysentery Infections in immunocompromised 	20
				100
	End Block Assessment	Assessment tools: MCQs & SAQs/SEQs		

MODULE- III			
DURATION: 10 WEEKS		Practical Topics	
S No	THEME	LEARNING OUTCOMES	%
1	Stool R/E	Tell the steps for performing stool R.E. List the indications for performing stool R/E. List the transport media for stool sample. Interpret the result of stool R/E	10
2	Ova /Cyst	Define the basic terms of parasitology. Perform wet mount to identify various ova and cysts of parasites on the basis of their morphology. Outline the important characteristics of parasites.	15
3	Malarial parasite	Apply the concept of making thick and then blood films in detection of malarial parasite. Outline important characteristics of malarial parasites. Identify and differentiate between various stages of malarial parasites in blood smears.	15
4	LD bodies	Outline important characteristics of LD Bodies. Identify LD bodies in slides.	10
5	Pregnancy test	Perform the test Interpret the result Explain the principal of test	10
6	Lipomas	Identify lipoma on gross examination and cut section of specimen. Identify the slide of lipoma. Outline the characteristics.	10
7	Leiomyomas	Assess leiomyoma Identify it on gross examination Identify the slide of leiomyoma.	10
8	Basal cell carcinoma	Differentiate between basal cell and squamous cell carcinoma. Enumerate the risk factor involved with basal cell carcinoma. Identify it on the basis of gross appearance and site of lesion Identify the slide of skin with basal cell carcinoma.	10
9	Squamous cell carcinoma	Differentiate between basal cell and squamous cell carcinoma. Assess the risk factors and common sites of squamous cell carcinoma Identify it on gross specimen. Identify the slide of skin with squamous cell carcinoma.	10

**TABLE OF SPECIFICATIONS
FOR
PRE-ANNUAL/ANNUAL 3RD PROFESSIONAL EXAMINATION: THEORY (2022)**

Time Allowed =03 hours (Including MCQs)

Marks of theory paper =120

Internal assessment =30

Total marks =150

Pass Marks =75

60 x MCQs = (60 Marks) Time = 1 hour 10 Min

10 x SAQs/SEQs/ Scenario based question: 06 Marks each (60 Marks)

Time = 1 hour 05 Min

TOPIC	NUMBER OF MCQs (60) Recall (20) Application (40) (1 mark each)	NUMBER OF SAQs/SEQs (10) (06 Marks each)
General Pathology		
Cell Injury, Cell death & Adaptations	05	01
Inflammation & repair	05	01
Disorders of the Immune system	04	01
Genetics & Pediatric disorders	02	
Hemodynamic disorders, Thrombo-embolism and shock	05	01
Neoplasia	05	01
Environmental diseases	02	-
Microbiology		
General Microbiology	06	01
Special Bacteriology	10	02
Virology	07	01
Mycology	03	
Parasitology	07	01
Total	60 (60 Marks)	10 (60 marks)

**TABLE OF SPECIFICATIONS
FOR
PRE-ANNUAL/ANNUAL PROFESSIONAL EXAM: PRACTICAL**

Practical = 120

Internal Assessment = 30

Total marks =150

Pass Marks = 75

Gen Viva Voce		Practical		Internal Evaluation	Total
Int Examiner	Ext Examiner	*Lab Work	Notebook	30	150
30	30	56	04		

***Marks Distribution (OSPE/Practical):**

Unobserved stations (OSPE): 3 x 12 Stations= 36 marks

Practical/ Performance: 5 x 4 Practical = 20 marks (Select any three from the list given below)

S. No	Practical Topic	S. No	Practical Topic
1.	Gram Stain	6.	Urine R.E
2.	ZN Stain	7.	Biochemical/ Sugar set
3.	Catalase Test	8.	Stool R/E/ Ova / Cyst
4.	Oxidase Test	9.	Pregnancy Test
5.	Motility Test	10.	Focusing of microscope at low high and oil immersion for identification of tissue

THEORY: Internal Assessment Calculation

A	B	C	D
Roll No.	Name	All Blocks/ Pre annual Exams or any other exam	Total Marks of internal assessment Out of 30
Total		Sum of Marks obtained x15/ sum of total marks in all internal exams	

PRACTICAL: Internal Assessment Calculation

A	B	C	D
Roll No.	Name	OSPE /all practical Class tests throughout the year /Pre annual practical Exams or any other exam	Total Marks of internal assessment Out of 30
Total		Sum of Marks obtained x15/ sum of total marks in all internal exams	

Teaching Faculty of CMH Lahore Medical College

S No	Name	Designation
1	Prof. Dr. Adbus Sattar	HOD/Professor, Chemical Pathology
2	Prof. Dr. Muhammad Saeed Anwar	Professor, Microbiology
3	Prof. Dr. Uzma Rihan	Professor, Histopathology
4	Prof. Dr. Sidra Shafiq Cheema	Professor, Histopathology
5	Brig (R) Muhammad Abdul Naeem	Associate Professor Haematology
6	Dr. Afia Sarwar	Associate Professor Histopathology
7	Dr. Kanwal Cheema	Assistant Professor
8	Dr. Atiya Begum	Assistant Professor
9	Dr. Fatima tuz Zahra	Demonstrator
10	Dr. Amal Mahmood	Demonstrator
11	Dr. Ayesha Bashir	Demonstrator
12	Dr. Maheen Asad	Demonstrator
13	Dr. Nabeel Nasir	Demonstrator

Teaching Faculty of Combined Military Hospital, Lahore

S No	Name	Designation
1	Brig. M. Qaiser Alam Khan	Assistant Professor
2	Col. Helen Mary Robert	Assistant Professor
3	Lt. Col Hamid Nawaz Tipu	Assistant Professor
4	Lt. Col Bushra Parveen	Assistant Professor
5	Lt. Col. Zeeshan Rana	Assistant Professor
6	Lt. Col. Muhammad Abid Farooq	Senior Lecturer
7	Maj. Saadiya Mushtaq	Senior Lecturer
8	Maj. Muhammad Rizwan	Senior Lecturer

TEACHING FACILITIES AVAILABLE ON CAMPUS

1. LECTURE HALL:

The college has designated lecture halls with a seating capacity of 150, equipped with multimedia, microphone, a computer system and UPS to provide an uninterrupted environment conducive for active learning.

2. PATHOLOGY LABORATORY:

The pathology laboratory is fully equipped catering to the need of our students.

The following facilities are available for the students in order to have a good hands-on experience.

- a. A **multi head microscope** with camera and screen facility.
- b. **Microscopes** for individual use.
- c. **Multiple stations** for practice of staining techniques.
- d. A **vast collection of slides** related to microbiology, hematology and histopathology.
- e. A 36-inch **LED screen** used to project slides when required by the facilitator.
- f. Two **Refrigerators** for storage of culture media.
- g. A **designated -20 °C freezer** for storage of bacterial strains.
- h. **Autoclave** (for sterilization purposes)
- i. **Hot air oven** (for sterilization purposes)
- j. **Incubator**
- k. A **distillation apparatus** for a continued supply of distilled water in the laboratory.
- l. **Tissue processor** used for histopathology specimens.
- m. Miscellaneous instruments required for the smooth running of the laboratory. For students safety and hygiene:

- n. An **Eye wash area**.
- o. Multiple areas designated for **hand washing** and **alcohol-based hand sanitizers** provided in the laboratory.
- p. **First aid box** as well as a **spillage kit** also available in the laboratory in case of any accident (cuts, burns or spills in the lab)

3. PATHOLOGY MUSEUM:

The pathology department is also equipped with a state-of-the-art museum, containing hundreds of gross pathology specimens along with their corresponding microscopic slides, that are used by the students when they are studying the gross morphology of various diseases and tumors.

TEACHING AND LEARNING STRATEGIES

The following teaching/learning methods are used to promote better understanding:

- Lectures
- Small group discussions
- Practical Classes in the laboratory
- Case based learning
- Tutorials
- E-Learning

Lectures:

A lecture is an easy way for instructors to intellectually engage and involve students as active participants in a lecture-based class of any size. The instructor can apply a blend of various interactive techniques in the class.

Small group discussion (SGD):

Small group discussions help the shy and less articulate to contribute more. Students learn from each other. Everyone gets more practice at expressing their ideas. A two-way discussion is almost always more creative than individual thoughts and clears out misconceptions. This teaching format helps students to clarify concepts, acquire skills or attitudes. Students are able to apply the knowledge gained from lectures, tutorials and self-study. The facilitator role is to ask probing questions, summarize, or rephrase to help clarify concepts.

Practical session:

Skills relevant to respective module are observed and practiced where applicable in pathology laboratory. For e.g. how to use a microscope for various slides, staining techniques, biochemical and serological tests etc.

Self-Directed learning (SDL):

Self-directed learning involves studying without direct supervision in a classroom/Library and is a valuable way to learn growing in popularity among students. Students' assume responsibilities of their own learning through individual study, sharing and discussing with peers, seeking information from various learning resources. Students can utilize the time within the college scheduled hours of self-study.

Case based learning and Tutorials:

Tutorial or case-based learning is another method of transferring knowledge which is more interactive and specific than a book or a lecture, as it seeks to teach by example.

E- Learning:

Due to the Covid-19 pandemic, education has changed dramatically, with the distinctive rise of e-learning, whereby teaching is undertaken remotely and on digital platforms.

Online classes on zoom have been started, in which conventional lectures are delivered. Apart from lectures, students are engaged by giving them assignments, quizzes and presentations.

WEEKLY TRAINING PROGRAM 3rd Year MBBS

1) LECTURES: 50 minutes each

Microbiology: 3 Lectures

General Pathology: 3 Lectures

2) CBL: 50 minutes

1 per week

3) PRACTICAL: 90 minutes

3 batches x 04 days practical

4) ASSESSMENT:

A) Number of class test: 2 per module

1 class test monthly

B) Exam: End of module

Time tables:

The course content and time tables of each module are shared on the department notice board as well the college LMS portal in advance.

ASSESSMENT TOOLS

Theoretical knowledge is tested by a written examination system consisting of multiple choice questions (MCQs) and short answer questions (SAQS).

The assessment of practical knowledge involves objective structured practical examinations (OSPE).

ASSESSMENT PROTOCOL

- a. There will be end of module exams taken at the end of module I, II and III. The syllabus for end module examination will be announced by the department at least 02 weeks prior to examination. End block exam will be conducted by the Pathology Department. Assessment tools to be decided by respective faculty. Schedule and date will be announced by the examination branch of respective institute.
- b. Pre annual exam will be taken for both theory and practical after completion of the curriculum. Pre-annual examination will cover the entire syllabus. Table of specification for Pre annual exam is similar to annual exam. Schedule for Pre-annual exam (Theory and Practical) will be announced by the examination branch of respective institute.
- c. Marks of End block and Pre annual exams will contribute to internal assessment
- d. Schedule for annual examination (Theory and Practical) will be announced by NUMS. Practical examination will be conducted by Pathology department while theory part will be conducted by the examination Department, NUMS.

Attendance Requirement:

More than 75% attendance is mandatory to sit for the examinations.

LEARNING RESOURCES FOR STUDENTS

1. Robbins & Cotran Pathologic Basis of Disease.
2. Review of Medical Microbiology and Immunology by Warren Levinson.
3. Jawetz, Melnick & Adelberg's Medical Microbiology.
4. District Laboratory Practice in Tropical Countries by Monica Cheesbrough.