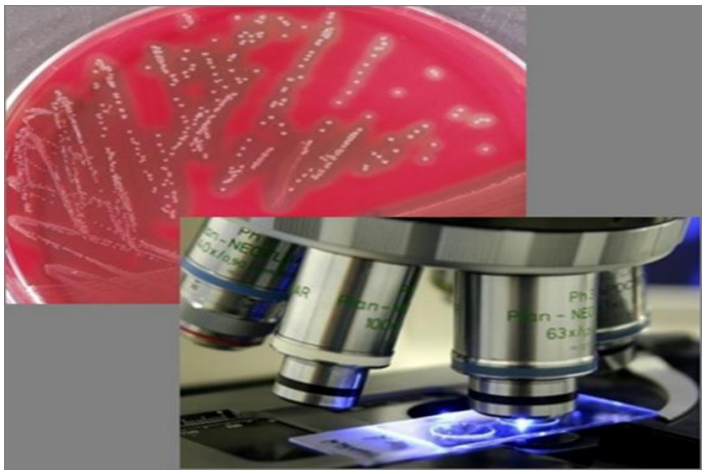
LAHORE
MEDICAL & DENTAL
COLLEGE

DEPARTMENT OF PATHOLOGY

STUDY GUIDE FOR 3rd yr MBBS

(Session 2024)



LAHORE MEDICAL AND DENTAL COLLEGE, LAHORE

LMDC is committed in pursuit of excellence to providing the best academic facilities to its students.

LMDC Vision

“To foster a culture of innovation, diversity, and learning for our students by putting students first and training them to be the best physicians, researchers, and visionaries.”

LMDC Mission

“To train future leaders of medicine who set new standards in knowledge, care and compassion.”

The well qualified and committed faculty of LMDC provides a combination of nurturing support and challenge to the students so reach their maximum potential.

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CONTENTS

1. **Pathology Department Faculty**
2. **Introduction/Rationale of Subject**
3. **Learning Outcomes**
4. **Teaching content (Syllabus UHS/PMDC)**
5. **Instructional Strategies**
6. **Details of Teaching**
7. **Assessment Methods**
   - **Exam Rules (Formative & Summative)**
   - **Internal Assessment**
8. **Learning resources**
9. **Class Timetable**
10. **Counselling**
    a. **Career Guidance**
    b. **Psychological Guidance**

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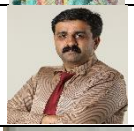
FACULTY INTRODUCTION

	Name	Designation	Qualification
1	 Dr. Shazia N. Ibnerasa	Prof. of Histopathology Head of Path Dept.	MBBS, M. Phil, MHPE
2	 Dr. Saadia Chaudhry	Prof. of Microbiology	MBBS, M. Phil
3	 Dr. Fauzia Sadiq	Prof. of Chemical Pathology	MBBS, M. Phil, MHPE (Thesis Remains)
4	 Dr. M. Shahbaz Amin	Prof. of Histopathology	MBBS, DCP, MCPS, FCPS (Histopath),
5	 Dr. Nazia Ahmad	Associate Prof. Hematology	MBBS, M. Phil, (CMT, CHPE in Process)
6	 Dr. Sonia Tahir	Assistant Prof. Microbiology	MBBS, M. Phil, (CHPE in Process)
7	 Dr. M. Rizwan	Assistant Prof. Histopathology	MBBS, M. Phil, (CMT in process)
8	 Dr. Zahid Asgher	Assistant Professor Histopathology	MBBS, Diplomate American Board (Histo & Cytopathology)
9	 Dr. Maimoona Aslam	Assistant Prof. Histopathology	MBBS, FCPS (Histo) FRC-Path (Part-I)
10	 Dr. Hafiza Fajar Shabbir	Demonstrator	MBBS
11	 Dr. Khadija Aftab	Demonstrator	MBBS
12	 Dr. Huma Anwar	Demonstrator	MBBS

13		Dr. Sadaf Qayyum	Demonstrator	MBBS
14		Dr. Umber Sattar	Demonstrator	MBBS
15		Dr. Faiza Javaid Tariq	Demonstrator	MBBS
16		Dr. Fahum Akhtar	Demonstrator	MBBS
17		Dr. Khuzaima Ahmad	Demonstrator	MBBS
18		Dr. Sobia Wazeer Ali	Demonstrator	MBBS
19		Dr. Hiba Tehrim	Demonstrator	MBBS
20		Dr. Rabia Chaudhry	Demonstrator	MBBS
21		Dr. Samreen	Demonstrator	MBBS
22		Dr. Ayusha	Demonstrator	MBBS

INTRODUCTION

The primary goal of the pathology course is to initiate the medical student in the study of disease. Without a clear understanding of the etiology (cause), pathogenesis (development), pathological anatomy, and pathophysiology of disease, clinical medicine would mean little more to the student than memorization of clinical syndromes and the empirical treatments applied to them. These concepts are developed in close association with the other basic sciences and with the clinical science that is also being introduced currently. This study guide will give an insight to the students about all these competencies for a 7-star doctor and how to plan their educational activities in the subject of Pathology.

COURSE REQUIREMENT

Students need to have basic knowledge of Anatomy, Physiology, Biochemistry to understand the pathogenesis and laboratory diagnosis of different infectious diseases and pathological phenomenon of underlying diseases.

TARGET AUDIENCE:

3rd year M.B.B.S (SESSION 2024)

DURATION OF COURSE:

- 9 months (36weeks)
- Teaching hours according to PMDC/PMC
- 12TH FEB 2024 – November 2024
- Send-up: OCTOBER 2024
- Professional exam: Jan 2025 (tentative date)
- Total lectures 5 /week = 120 lectures approx.
- General Pathology + Microbiology (42 + 78) lectures
- Practicals 1/week= 4-5 /month=30 approx
- Tutorial 1/week= 4-5/ month= 30 approx
- Breaks: 4 weeks summer break

LEARNING OBJECTIVES

GENERAL PATHOLOGY

Goal:

The goal shares a knowledge about basic principles of Pathology and Microbiology.

OBJECTIVES

Knowledge

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

1. Describe the structure and ultrastructure of a sick cell, mechanisms of cell degeneration, cell death and repair and be able to correlate structural and functional alterations.
2. Explain the pathophysiological processes which govern the maintenance of homeostasis, mechanisms of their disturbance and the morphological and clinical manifestations associated with it.
3. Describe the mechanisms and patterns of tissue responses to injury which form the basis of pathophysiology of disease.

Skills

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

1. Identify gross and microscopic lesions of basic pathological processes.

MICROBIOLOGY

Goal: The goal is to provide an understanding of the natural history of infectious disease to deal with etiology, pathogenesis, laboratory diagnosis, treatment, and control of infections in the community.

OBJECTIVES

Knowledge

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

1. State the infective micro-organisms of the human body and describe the host parasite relationship.
2. List pathogenic micro-organisms (bacteria, viruses, parasites, fungi) and describe the pathogenesis of the diseases produced by them.
3. State or indicate the modes of transmission of pathogenic and opportunistic organisms and their sources, including insect vectors responsible for transmission of infection.
4. Describe the mechanisms of immunity to infections.
5. Acquire knowledge on suitable antimicrobial agents for treatment of infections and scope of immunotherapy and different vaccines available for prevention of communicable diseases.
6. Apply methods of disinfection and sterilization to control and prevent hospital and community acquired infections.
7. Recommend laboratory investigations regarding bacteriological examination of food and water.

Skills

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

1. Plan and interpret laboratory investigations for the diagnosis of infectious diseases and to correlate the clinical manifestations with the etiological agent.

2. Identify the common infectious agents with the help of laboratory procedures and use antimicrobial sensitivity tests to select suitable antimicrobial agents.

3. Perform commonly employed bed-side tests/bench tests for detection of infectious agents such as blood film for malaria, filaria, gram staining and AFB staining and stool sample for ova cyst.

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COURSE OUTLINE (SYLLABUS UHS/PMDC)

GENERAL PATHOLOGY

CELL INJURY

1. Necrosis, Ischemia, Hypoxia, Infarction and Gangrene Oncosis and Autolysis.
2. Sequence of the ultrastructural and biochemical change which occur in the cell in response to the following: Ischemia, Immunological injury, e.g., Asthma / SLE / Anaphylactic reaction, Physical agents, e.g., Radiation, Genetic defects e.g., Thalassemia / Hemophilia, Nutritional deficiency, e.g., Kwashiorkor, Infectious agents: Viruses, e.g., Hepatitis, Bacteria, e.g., Staphylococcus aureus, Fungi, e.g., Candida Parasites, e.g., Malaria, Nutritional deficiency.
3. Irreversible and reversible injury
4. Apoptosis and its significance.
5. Necrosis and its types
6. Exogenous and endogenous pigmentation.
7. Dystrophic and metastatic calcification along with clinical significance.
8. Metabolic disorders
9. Lipid disorders, Steatosis of liver, Hyperlipidemia
10. Protein disorders
11. Carbohydrate disorders

INFLAMMATION, MEDIATORS OF INFLAMMATION

1. Role of inflammation in the defense mechanisms of the body.
2. Vascular changes of acute inflammation and their relation to morphological and tissue effects.
3. Process of Chemotaxis, Opsonization and Phagocytosis.
4. Role of cellular components in inflammatory exudate.
5. Exudates and transudate.
6. Important chemical mediators of inflammation.
7. Pathway of Arachidonic Acid metabolism.
8. Role of products of Arachidonic acid metabolism in inflammation.
9. Mechanism for development of fever, with reference to exogenous and endogenous pyrogens.
10. Chronic inflammation including Granulomas.
11. Granuloma and its types along with causes.
12. Systemic effects of acute and chronic inflammation and their possible outcomes.
13. Significance of ESR.
14. Induced hypothermia in medicine.
15. Healing in specialized tissue.

WOUND HEALING

1. Repair and regeneration.
2. Wound healing by first and second intention.
3. Factors that influence the inflammatory reparative response.
4. Wound contraction and cicatrization.
5. Formation of granulation tissue.
6. Complications of wound healing.

DISORDERS OF CIRCULATION

Thrombo-embolic disorders and their modalities

1. Etiology and pathogenesis of thrombosis.
2. Possible consequences of thrombosis
3. Difference between thrombi and clots
4. Classification of emboli according to their composition.
5. Difference between arterial and venous emboli.

Hemorrhage, Hyperemia and Congestion

6. Definitions of common types of Hemorrhage
7. Types of hyperemia
8. Difference between hyperemia and congestion

Infarction

9. Types of infarction
10. Difference between anemic and hemorrhagic infarct
11. Morphological picture of infraction in different organ systems

Disorders of the circulation and shock

12. Edema, ascites, hydrothorax and anasarca.
13. Pathophysiology of edema with special emphasis on CHF.
14. Pathogenesis of four major types of shock (Hypovolemic, cardiogenic, vasovagal & septic) and their causes.
15. Compensatory mechanisms involved in shock.

GENETICS

1. Common sex linked, autosomal recessive and autosomal dominant disorders.
2. Common genetic mutations.
3. Diseases associated with consanguineous marriages.
4. Molecular biology techniques.

GROWTH DISORERS/NEOPLASIA

1. Atrophy and Hypertrophy, Agenesis, Dysgensis, Aplasia, Hypoplasia, Hyperplasia, Metaplasia, Dysplasia, Neoplasia, Anaplasia,.
2. Cell cycle and cell types (stable, labile, permanent)
3. Mechanisms controlling cell growth
4. Classification systems of tumors.
5. Characteristics of benign and malignant tumors

6. Difference between Carcinoma and Sarcoma.
7. Grading and staging system of tumors.
8. Biology of tumor growth
9. Process of carcinogenesis
10. Host defense against tumors.
11. Mechanism of local and distant spread.
12. Local and systemic effects of tumors.
13. Tumor markers used in the diagnosis and management of cancers.
14. Common chemical, physical agents and viruses related to human cancer.
15. Epidemiology of common cancers in Pakistan.
16. Radiation and its effects on tissues.
17. Cancer screening.

IMMUNOLOGY

1. Antigen, antibody, epitope, hapten and adhesion molecules.
2. Difference between innate and acquired immunity.
3. Structure and function of major histocompatibility complex (MHC).
4. Cytokines.
5. Mechanism of humoral and cell medicated immunity.
6. Hypersensitivity reactions, Type I, Type II, Type III and Type IV.
7. Autograft, homograft, allograft and xenograft.
8. Immunotolerance and immunoparalysis.
9. Mechanism involved in allograft rejection and steps that can be taken to combat rejection.
10. Classification of Immunodeficiency disorders
11. Basis of autoimmunity.
12. Tissue transplantation.
13. Pathology and pathogenesis of AIDS.
14. Lab diagnosis of immunological diseases.

MICROBIOLOGY

1. Defense mechanisms of the body.
2. Microbial mechanisms of invasion and virulence.
3. Difference between sterilization and disinfection.
4. Methods of disinfection and sterilization of the following:
   4.1. Facility where the doctor practices,
   4.2. Examination table,
   4.3. Any spillage e.g. sputum, vomitus, stool, urine, blood,
   4.4. Examination tools, e.g., thermometer, nasal and ear specula and spatula,
5. Principles of aseptic techniques such as Venepuncture, urinary catheterization, bandaging, suturing and lumber puncture.
6. Universal precautions for infection control.

7. General principles of the following serological tests:
   7.1. ELISA – Hepatitis (A, B, C, D, E, G) Rubella, CMV and HIV
   7.2. PCR
   7.3. Haemagglutination – TPHA
   7.4. Western Blot –HIV
   7.5. Malaria.
8. Interpretation of :
   8.1. Culture reports
   8.2. Serological reports and
   8.3. Microscopic reports of gram stain and ZN stain.
9. Principles of proper collection and submission of specimens for laboratory investigations
10. General characteristics and taxonomy of Bacteria, Rickettsia, Chlamydia, Viruses and Fungi.
11. Communicable, Endemic, Epidemic, and Pandemic Diseases, Carriers Pathogens, Opportunists, Commensals and Colonizers.
12. Microorganisms responsible for infection of the following organ systems:
    12.1. Central Nervous System
    12.2. Respiratory System
    12.3. Gastrointestinal System
    12.4. Genital System
    12.5. Urinary System
    12.6. Infections of Bones and Joints
    12.7. Zoonosis
    12.8. Infection of the Skin
    12.9. Hepatic Infections
13. Pathogenesis, Treatment, Epidemiology, Prevention and Control of the following organisms:

Bacteria

Staphylococcus aureus, Streptococcus pneumoniae, Beta hemolytic streptococcus group a & b, Diphtheria sp., Bordetella sp., Bacillus anthracis, Clostridium perfrignes, Clostridium botulinum, Clostridium difficile, Clostridium tetani, Actinomycies israelli, Nocardia asteroids, Neisseria meningitis, Neisseria gonorrhoeae, Gardenella vaginalis, Haemophilus influenzae, Mycobacterium tuberculosis, Mycobacterium leprae, E.coli, Klebsiella, Proteus, Salmonella, Shigella, Yersinia pestis, Pseudomonas, Vibrio cholera, Vibrio parahemolyticus, Campylobacter jejuni, Helicobacter pylori, Legionella, Mycoplasma pneumoniae, Chlamydia, Treponema pallidum, Leptospira, Rickettsia sp.

Viruses

Mumps, Herpes, Measles, Influenza, Para influenza, RSV, Hepatitis A, B, C, D, E Rota virus, CMV, EBV, Rubella, Chicken Pox, HIV, Rabies

Fungi

Cryptococcus neoformans, Candida albicans, Tinea species

Protozoa

Plasmodium species, Giardia lamblia, Entamoeba histolytica, Cryptosporidium Leishmania species, Trichomonas vaginalis, Toxoplasma gondii, Pneumocyctis carinii.

Helminths

Ascaris lumbricoides, Ancylostoma duodenale, Trichuris trichuria
Enterobius vermicularis, Filaria species, Strongyloides stercoralis
Schistosoma species, Echinococcus species, Taenia solium
Taenia saginata, Hymenolepis nana

PRINCIPLES OF ANTI MICROBIAL ACTION.

1. Antibiotics, selective toxicity, bacteriostatic and bactericidal.
2. Host determinants in relation to selection of an antimicrobial drug for therapy.
3. Minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC)
4. Bacterial resistance and the mechanisms involved in acquiring bacterial resistance.
5. Mechanisms involved in transfer of drug resistance to bacterial resistance.
6. Mode of action of various antimicrobial drug groups.
7. Superinfection and cross sensitivity.

LIST OF COMMON ORGANISMS CAUSING ORGAN SYSTEM EFFECTS

1. Common organisms causing CNS Infections

Bacteria

Steptococcus pneumoniae, Beta hemolyticus srteptococcus group b, Neisseria meningitidis, Haemophilis influenzae, Mycobacterium tuberculosis, E.coli Listeria monocytogenes

Viruses

Enterovirus, Mumps, Herpes, Adenovirus

Fungus

Cryptococcus neoformis,

Protozoa

Malaria, Toxoplasma

2. Common organisms causing respiratory tract infection

Bacteria:

Steptococcus pneumoniae, Beta hemolyticus streptococcus group b, Diptheria sp. Bordetella sp., Hemophilus influenzae, Mycobacteriurn tuberculosis, Klebsiella Legionella, Mycoplasma pneumoniae,

Viruses
Herpes, Adeno virus, Measles, Influenza, Para influenza, Rhinovirus, RSV

Protozoa
Pneumocystic carinii

3. Organisms causing gastrointestinal tract infection / infestation
Bacteria
Clostridium difficile, Mycobacterium tuberculosis, Salmonella, Shigella, Vibrio cholera
Vibrio parahemolyticus, Campylobacter jejuni, Helicobacter pylori,

Viruses
Hepatitis A, Rota,

Fungus
Cryptococcus neoformis

Protozoa
Giardia lamblia, Entameba histolytica, Cryptosporidium

4. Common organisms causing hepatic infections
Bacteria
Streptococcus species, Coliforms, Anaerobes,

Viruses
Herpes, Hepatitis A, B, C, D, E, CMV, EBV,

Protozoa
Entameba histolytica, Tape worms, Echinococcus granulosus

5. Common organisms causing skin infection
Bacteria
Staphylococcus aureus, Streptococcus pyogenes, Actinomyces israelli
Nocardia asteroids, Mycobacterium tuberculosis, Mycobacterium leprae
Corynebacterium diphtheriae,

Viruses
Herpes, Measles, Rubella,, Chicken pox, Molluscum contagiosum

Fungus
Candida albicans, Tinea species

Arthropodes
Sarcoptes scabiei, Pediculus species, Cinex lectularius

Helminths
Filaria species, Strongyloides stercoralis, Schistosoma sp.

Protozoa:
Leishmania species.

6. **Common organisms causing bone and joint infection**
   Bacteria:
   Staph aureus, Streptococcus pyogenes, Haemophilus influenzae, Neisseria gonorrhoeae, Brucella melitenesis, Salmonella typhi, Strep. pneumonae, Pseudomonas sp. and Mycobacterium tuberculosis.

7. **Common organisms causing genital infection**
   Bacteria: Mycoplasma urealyticum
   Viruses: Pox, Herpes, Hepatitis B, HIV
   Fungus: Candida albicans
   Arthropodes: Sarcoptes scabiei
   Protozoa: Tricomonas vaginalis

8. **Common organisms causing zoonosis**
   Viruses: Rabies,
   Protozoa: Toxoplasma gondii, Leishmania sp.
   Helminthics: Echinococcus sp.

LIST OF PRACTICALS (OSPE) TO BE PERFORMED

MICROBIOLOGY:

1. Sterilization of wire loop by flaming. Smear making and Gram staining and identification of Gram +ve and Gram –ve bacteria.
2. ZN staining and identification of acid fast bacilli.
3. Bench tests: Catalase test, Coagulase test, Oxidase test.
4. Identify and describe the characteristics of the following culture media:
5. Blood agar, Chocolate agar, MacConkey media & LJ media.
6. Biochemical tests for identification of bacteria.
7. Identify the autoclave, hot air oven and demonstrate their working?
8. Antibiotic sensitivity testing & anaerobic jar.
9. Blood culture- sample collection & processing.
10. Urine examination.
11. Stool examination.
12. Malarial parasite examination.

GENERAL PATHOLOGY:

1. Intracellular adaptations, Necrosis and intracellular accumulations
2. Pigmentation, fatty change
3. Acute and chronic inflammation,
4. Chronic venous congestion
5. Thrombus, infarction,
6. Benign and malignant Mesenchymal tumors,
7. Benign and malignant epithelial tumors
8. Granulation tissue
9. Types of giant cells
10. Exudate and transudate

INSTRUCTIONAL STRATEGIES

TEACHING METHODOLOGY:

1. Lectures
2. Practicals
3. Small group discussions(tutorials)
4. OSPE
5. MCQ assignments
6. SEQ Assignments
7. Viva
8. Online (if required)

PRACTICAL & TUTORIAL SESSION:

- Class is divided into 5 batches
- Two batches will be coming to Pathology Department every week (Pathology and Clinical pathology)
- The batch coming for Clinical pathology practical will be learning about the clinical aspects of disease and MCQ practice assignments. This batch is involved in small group discussions by allocation of subject topics.
- Friday Tutorial time would be reserved for class tests discussion, OSPE or viva.

FORMAT OF TUTORIAL CLASSES (small group discussion)

1. Tutorial classes will be interactive sessions.
2. Any ambiguity of the students on the topics being taught in the class will be removed.
3. There will be an MCQ test in tutorials and these MCQs will be discussed afterwards.
4. Students will be given written assignments/or presentation topics to be done or prepared in first 30 minutes. Presentations will be given verbally.
5. The assignments will be discussed and answers checked by tutor at that time
6. Every student will submit a copy of his/her Assignments to the class incharge.
7. Topics of presentations and test will be displayed on the notice board or conveyed to class through class representatives.
8. Presentations/Assignments and tests will be given weightage in internal evaluation.
9. Attendance in pathology tutorial is mandatory for all students.

TEACHING SCHEDULE

THEORY
Face to Face teaching

Starting date of the session	12th FEB, 2024
Venue	
Course coverage	9 Months
No. of total lectures	More than 120 @ 4/week
Days of pathology lectures	Tues, Wed, Thurs, Fri

PRACTICALS / TUTORIALS

Starting date of the session	12th Feb, 2024
Venue	Histopathology Laboratory& microbiology laboratory
Days for Practicals	Monday-Friday

LONG TUTORIAL

Long tutorial	Monday (lecture hall # 3)

LECTURE BREAKUP OF GENERAL PATHOLOGY & MICROBIOLOGY

	Topics	Teachers/Facilitators	Lectures count
	GENERAL PATHOLOGY		
1.	Cell Injury Cell Adaptations	Prof. Shazia Ibnerasa Dr. Maimoona	4 4
2.	Inflammation	Prof. Shazia Ibnerasa	06
3.	Repair	Dr. Muhammad Rizwan	03
4.	Hemodynamics	Dr. Nazia Ahmad	07
5.	Genetics	Dr. Fauzia Sadiq	04
6.	Neoplasia	Dr. Shahbaz Amin	08
7.	Immunity	Prof. Shazia Ibnerasa	06
	MICROBIOLOGY		
1.	Bacteriology	Prof. Saadia Ch. Dr. Sonia Tahir	52
2.	Parasitology	Dr. Sonia Tahir	12
3.	Mycology	Prof. Saadia Ch.	04
4.	Virology	Prof. Saadia Ch. Dr.Sonia Tahir	10

ASSESSMENT METHODS

Summative Assessment

UHS table of specifications for Professional exams

UNITS	MCQS	SEQS
Cell Injury	04	01
Inflammation, Healing & Repair	06 02	01 01
Neoplasia	09	01
Genetics	02	01
Hemodynamics	04	01
Bacteriology	14+GEN 04	03
Mycobacteria	-	01
Immunity	05	01
Virology	06	01
Mycology	04	01
Parasitology	05	01
TOTAL	65	14

Formative assesment:

CLASS TESTS (DURING ACADEMIC SESSION)

1. On 3rd Monday of every month during Long tutorial
2. On all topics covered during the month.
3. Grading will be as follows (Mostly, depending on tests content)

Total marks = MCQs + SEQs

50 = 30 + 20

MIDTERM AND SENDUP EXAMINATION

Total marks = MCQs + SEQs

135 = 65 + 14

INTERNAL ASSESSMENT CRITERIA

- 10 % of total marks
- Total marks = 300
- Internal Assessment = 30 (15 marks in theory + 15 marks in Practical)
- Approximate weightage
  - Attendance 20% of total (6/30)
  - Assessment 60% each of total (18/30)
  - Behavior/Professionalism 20% of total (6/60)
- Break-up of 30 marks

Lecture/Practical attended	Test average	Midterm	Sendup	Behavior	Total
6	6	6	6	6	**30**

Lectures/Practicals attendance scale	
>90%	6
80 - 89%	5
70 - 79%	4
60 - 69%	3
50 - 59%	2
<50%	1

Tests, Midterm and Sendup scale	
>75%	6
65 - 75%	5
55 - 64%	4
45 - 54%	3
35 - 44%	2
<35%	1

FEEDBACK OF ACADEMIC YEAR:

Feedback ON TEACHNG will be taken AT THE END OF SESSION.

CODE OF CONDUCT

TIMINGS

The students should strictly follow the timings of lectures, practical & tutorial classes. Entry of students in class rooms and laboratories will not be permitted after 10 minutes of scheduled time.

ATTENDANCE & SEND UP EXAMINATION

75% attendance and 50% of internal assessment are required for appearing in professional examination of the University Of Health Sciences, Lahore. If any student is caught marking a proxy in lectures, tutorial and practical classes, he/she along with the absentee will be marked absent for two consecutive classes. Any unfair means in internal examination will disqualify a student for appearing in professional examination.

INTERNAL EVALUATON

Internal evaluation carries 10% of the total marks of 2nd professional examination. This is based on the performance of internal examination system, assignments, presentations and student teacher communication in practical & tutorial classes. The students must bring college identity cards while appearing in module evaluations and examination.

PRACTICAL NOTE BOOKS AND LAB COATS

Practical note books carry 05 marks. The students should strictly follow the protocol mentioned. The students will not be allowed to attend practical and tutorial classes without lab coats.

LEARNING RESOURCES SUGGESTED READINGS:

TEXT BOOKS

1. Pathological Basis of Disease by Kumar, Cortan and Robbins, 10th Ed., W.B. Saunders.
2. Basic Pathology by Cotran & Kumar 11th edition (Medium Robbins)
3. Review of Medical Microbiology and Immunology by Lewinson http://www.pdfbooks11.com/2015/04/download-free-ebook-review-of-medical-Microbiology-and-Immunology.html
4. Medical Microbiology and Immunology by Levinson and Jawetz 9th Ed., Mc Graw-Hill.
5. Medical Genetics by Jorde, 3rd Ed., Mosby.

REFERENCE BOOKS

1. Illustrated Pathology
2. Pathology Practical Book by Harsh Mohan
3. Concise Pathology for Exam Preparation by Bhattacharya
4. District Laboratory Practice in Tropical Countries, Part 1 & 2 by Monica http://www.medbox.org/district-laboratory-practice-in...part-2/download.pdf

WEBSITES

1. https://www.webpathology.com/
2. http://www.pathguy.com/
3. https://www.osmosis.org/
4. https://ilovepathology.com/

ADDITIONAL LEARNING RESOURCES

Museum Models

available in the museum are a rich learning resource for quick review of pathological diseased specimen related educational activities.

TEST PREPARATION/MCQS

1. Review of pathology – Robbins.
2. Pre-test in Pathology
3. BRS PATHOLOGY.

COUNSELLING

CAREER COUNSELLING

- Senior Faculty members provide necessary career counselling to students as per their need.
- Help and guidance is provided to students who wish to apply for their elective rotations both in the country and abroad.
- Students are facilitated on the development of their student curriculum vitae.

PSYCHOLOGICAL COUNSELLING

- Psychological support and guidance is provided in a systematic way.
- Struggling students, Students under stress and students in need of psychological support are pointed out by class tutors.
- These students are called for an initial assessment by respective senior faculty member.
- Depending on student's need, either the student is counselled and is actively monitored by a tutor or if needed, the student is referred to Colleges' nominated student councilor.