

**DEPARTMENT OF PATHOLOGY
LIAQUAT UNIVERSITY
OF MEDICAL & HEALTH SCIENCES,
JAMSHORO**



**Syllabus/Curriculum
For
M. Phil Pathology
(Histopathology)
LUMHS, Jamshoro**

Postgraduate Program in Pathology (Histopathology)

Mission of Program:

To provide an ideal learning and research environment that promotes evidence-based pathology education by developing competent, ethical, and research-oriented pathologists with advanced diagnostic knowledge, analytical skills, professional excellence, and a commitment to improving healthcare through quality laboratory services, innovation, and lifelong learning.

Degree Offered: M. Phil in Pathology(Histopathology)

- 1- **Duration:** Two Years
- 2- **Credit Hours:** 30 credit hours (24 credit hours course work & 06 credit hours research/thesis)
- 3- **Aim:**

To graduate candidates with M. Phil Degree in Pathology Histopathology.

4- **Rationale:**

In view of the shortage of qualified Pathologists in Pakistan, the M.Phil program in Histopathology is designed to cater for the need by preparing highly qualified Histopathologist, to teach and carryout research in Universities, Research Centers and Medical Institutions. Production of M.Phil degree holders in Histopathology will boost quality of teaching and research in medical institutions.

5- **Objectives:**

The Objectives of the M.Phil. program is that at the end of the training period trainee:

- Demonstrates in depth knowledge of the subject in order to come be a competent teacher in a medical institution.
- Demonstrates adequate knowledge of related subjects in order to have a broad based comprehension of the independently.
- Is able to advise clinical colleagues on the appropriateness of diagnostic Histopathology.
- Know the working principles and functions of the instruments used in histopathology laboratory.

6- Resources and Facilities:

The Department of Pathology possess sufficient capabilities in terms of faculty, supporting staff and material resources to carry out the prescribed M.Phil program in Histopathology. The department has well-established & well equipped histopathology laboratory with well trained supporting technical staff.

7- Course Contents:

- 7.1 Core/ Basic /Fundamental Course.
- 7.2 General Pathology.
- 7.3 Systemic / Special Pathology.
- 7.4 Cytopathology.
- 7.5 Immunohistochemistry.
- 7.6 Slide Seminar
- 7.7 Research and Thesis

8- Methods of Instructions:

- 8.1 Lecture
- 8.2 Tutorial
- 8.3 Lab Work
- 8.4 Journal Club
- 8.5 Consultation
- 8.6 Self Study

9- Reference Books:

- 1. Rosai & Ackerman's Surgical Pathology (Latest edition)
- 2. Sternberg's Diagnostic Surgical Pathology (Latest edition)
- 3. WHO series (Latest edition)
- 4. Robbin's Basis of Pathology (Latest edition)
- 5. Curran Atlas Gross Pathology (Latest edition)
- 6. Curran Atlas Microscopic Features (Latest edition)
- 7. The Bethesda System for Reporting Thyroid Cytopathology: Definitions, Criteria and Explanatory Books.
Edited by Syed Z. Ali
Edited by Edmund S. Cibas

8. Lymph node and spleen Cytohistology
Andrew S. Field and William R Gedde
9. Atlas of Thyroid Cytopathology with Histopathologic correlation
Author : Syed Ali
Author : Ritu Nayar
10. Breast Cytopathology
By Syed Z, Ali, Anil, Parwani
Publisher. Springer –Verlag New York
11. Histopathology of the skin, Walter F. Lever (Latest edition)
12. Manual and Atlas of Fine Needle Aspiration Cytology
S Vante R. O Rell /Gregory F. Sterrett
Chur Chill living stone (Latest edition)

COURSE OUTLINES

- The duration of course is two years.
- This two year course is comprised of:

SESSION – I:

A. The Core/ Basic/ Fundamental course shall be comprised of:

- a. Research Methodology
- b. Biostatistics
- c. Epidemiology
- d. Biomedical Ethics
- e. Information Technology

- B-
- i. Instrumentation and practical work to make acquainted with surgical pathology
 - ii. Laboratory Sciences

NOTE: There should be examination of module / course, student have to secure CGPA 3.0 out of 4.0 if semester system or 1st class if Annual system to pass it, however failure may be given two chances of re-sit. The successful candidates only shall be eligible for registration in the M. Phil course.

SESSION II:

M. Phil Part – I

SESSION III:

M. Phil Part – II

SESSION IV:

Thesis writing and Evaluation

QUALIFICATION FOR ADMISSION AND COURSE OF STUDY:

- ❖ Basic Qualification: MBBS.
- ❖ Each candidate shall get admission in the course on merit basis after passing written and oral test as per University rules and regulations.

SESSION – I:

Sub - Session A:

SUBJECT / MODULE	WEIGHTAGE	NO: OF LECTURES
Research Methodology	30%	33
Biostatistics	25%	28
Epidemiology	15%	16
Biomedical Ethics	10%	11
Information	20%	24

Sub – Session B:

1. Laboratory Sciences.
2. Instrumentation.

Note:

- ❖ The candidate is eligible to be registered in M. Phil, after passing examination of session- I

SESSION – II:

M. Phil – Part – I

Subject :

- Histopathology (Major)
- General Pathology (Minor)

Teaching Program Includes:

- ❖ Lecture and Practical classes of each subject
- ❖ Slide seminars on Histopathology work fortnightly
- ❖ General club meetings weekly

SESSION – III:

M. Phil – Part – II

Subject :

- Histopathology (Major)
- Microbiology / Haematology (Minor)

Teaching Program Includes:

- ❖ Lecture and Practical classes of each subject
- ❖ Slide seminars on Microbiology / Haematology work fortnightly
- ❖ Slide seminar on Histopathology work fortnightly
- ❖ General club meetings weekly

SESSION – IV:

Research work for Thesis writing and evaluation:

EXAMINATION:

M.PHIL. PART – I:

Theory:

- One Major and One Minor subject:

Histopathology (Major):

Computer Based Examination:

- ❖ Single best : 100 MCQs
- ❖ Duration : 2 hours.
- ❖ Marks : 100

Criteria of Passing:

- Minimum Passing marks in each paper will be 65%
- Passing marks in Viva Voce and Practical will be 65%.

General Pathology (Minor):

Computer Based Examination:

- ❖ Single best : 100 MCQs
- ❖ Duration : 2 hours.
- ❖ Marks : 100

Criteria of Passing:

- Minimum Passing marks in each paper will be 60%
- Passing marks in Viva Voce and Practical will be 60%.

NOTE:

The candidates who succeed in theory in respective subject shall be eligible to appear in the Practical and Viva Voce examination.

PRACTICAL AND VIVA VOCE EXAMINATION

Number of Examiners:-

- Two Internal and Two External Examiners in each subject.

Histopathology (Major subject):

Maximum marks = 100

- **Passing marks in viva voce and Practical will be 60%**

General Pathology (Minor Subject):

Maximum marks = 100

- **Passing marks in viva voce and Practical will be 60%**

Notes:

If the candidate fails in the Practical and Viva voce examination in respective subject, shall be declared as failure in that subject and shall be eligible to reappear in both parts (theory and practical) of that subject in the following examination as scheduled by University.

M.PHIL. PART – II:

Theory:

- One Major and One Minor subject:

Histopathology (Major):

Computer Based Examination:

- ❖ Single best : 100 MCQs
- ❖ Duration : 2 hours.
- ❖ Marks : 100

Criteria of Passing:

- **Minimum Passing marks in each paper will be 60%**
- **Passing marks in Viva Voce and Practical will be 60%.**

Microbiology / Haematology (Minor):

Computer Based Examination:

- ❖ Single best : 100 MCQs
- ❖ Duration : 2 hours.
- ❖ Marks : 100

Criteria of Passing:

- **Minimum Passing marks in each paper will be 60%**
- **Passing marks in Viva Voce and Practical will be 60%.**

PRACTICAL AND VIVA VOCE EXAMINATION

Number of Examiners:-

- Two Internal and Two External Examiners in each subject.

Histopathology (Major subject):

Maximum marks = 100

- **Passing marks in viva voce and Practical will be 60%**

Microbiology / Haematology (Minor Subject):

Maximum marks = 100

- **Passing marks in viva voce and Practical will be 60%**

Note:

If the candidate fails in the Practical and Viva voce examination in respective subject, shall be declared as failure in that subject and shall be eligible to reappear in both parts (theory and practical) of that subject in the following examination as scheduled by University.

SECTION – III

SUBMISSION OF THESIS:

- ❖ The thesis examination shall be done as per University rules and regulations.

EXAMINATIONS:

- ❖ Each examination shall be held as per University rules and regulations.
- ❖ For each subject, the table of single based MCQs shall be as under:-

TABLES OF SPECIFICATIONS FOR SINGLE BEST MCQs OF EACH SUBJECT

**TABLE OF SPECIFICATION OF
HISTOPATHOLOGY (MAJOR SUBJECT) FOR M. PHIL. (PATH) PART – I**

MARKS: 100

TIME: 02 HOURS

Topics	No. of BCQS	LEVEL OF DIFFICULTY		
		C1	C2	C3
Gastrointestinal tract	25	08	12	05
Liver, Biliary tract	12	04	03	05
Pancreas	08	03	02	03
The Skin	05	02	02	01
Female genital tract	15	06	04	05
Breast	10	03	04	03
The Kidney	15	06	04	05
Lymph nodes	10	03	04	03
TOTAL	100			

**TABLE OF SPECIFICATION OF
HISTOPATHOLOGY (MAJOR SUBJECT) FOR M. PHIL. (PATH) PART – II**

Topics	No. of BCQS	LEVEL OF DIFFICULTY		
		C1	C2	C3
Blood Vessels	09	04	02	03
The Heart	12	05	03	04
The Lung	15	05	04	06
Head and Neck	06	02	02	02
The central Nervous system	05	02	02	01
Eye	03	02	01	00
The Endocrine system	15	06	05	04
The Male genital tract	12	05	03	04
Lower urinary tract	08	03	02	03
Bone joints & soft tissue tumors	12	03	05	04
The peripheral nerve, Skeletal Muscle	03	01	01	01
TOTAL	100			

TOS OF GENERAL PATHOLOGY (MINOR)

Topics	No. of BCQS
Cell Injury, adaptation & cell death	14
Acute & chronic inflammation	13
Tissue renewal. Regeneration & repair	07
Haemodynamic disorder, thromboembolic disease and shock	12
Environmental & nutritional pathology	04
Diseases of Immune system	13
Neoplasia	13
Genetic diseases	12
Infectious diseases	07
Diseases of infancy & childhood	05
TOTAL	100

**TABLE OF SPECIFICATION OF
MICROBIOLOGY (MINOR SUBJECT) FOR M. PHIL (PATH) PART – II**

MARKS: 100

TIME: 02 HOURS

S. NO	CONTENT	C1	C2	C3	TOTAL	PERCENTAGE
01	General Microbiology	10	02	02	14	14% M. PHIL (PATH) PART – I
02	Gram+ ve Cocci	04	02	00	06	06%
03	Gram-ve Cocci	02	02	00	04	04%
04	Enterobacteriaceae	06	02	02	10	10%
05	Other Gram-ve Bacilli	06	02	02	10	10%
06	Gram+ve Bacilli	04	02	02	08	08%
07	Mycobacteria	02	02	00	04	04%
08	Chlamydia, Rickettsia, and Mycoplasma	04	00	02	06	06%
09	Viruses	06	02	02	10	10%
10	Mycology	04	00	00	04	04%
11	Parasitology: Protozoa and Helminthes	18	04	02	24	24%
GRAND TOTAL		66	20	14	100	100%

**TABLE OF SPECIFICATION OF
SYSTEMIC PATHOLOGY (MINOR SUBJECT) FOR M. PHIL (PATH) PART – II**

MARKS: 100

TIME: 02 HOURS

S. NO	CONTENT	C1	C2	C3	TOTAL	PERCENTAGE
01	Blood Vessels	02	02	00	04	04%
02	Heart	02	02	02	06	06%
03	Lung	04	02	02	08	08%
04	Head & Neck (Oral cavity, Nose, Ear, Neck, Salivary glands)	02	02	02	06	06%
05	Gastrointestinal tract	04	04	02	10	10%
06	Liver and biliary tract	02	02	02	06	06%
07	Pancreas (Exocrine)	02	00	00	02	02%
08	Kidney	04	02	02	08	08%
09	Lower Urinary tract	02	02	00	04	04%
10	Male Genital System	02	02	02	06	06%
11	Female Genital Tract	04	02	02	08	08%
12	Breast	02	02	00	04	04%
13	Endocrine System	02	02	02	06	06%
14	Skin	02	02	00	04	04%
15	Bone, Joints and soft Tissue	02	02	02	06	06%
16	Peripheral Nerve and Skeletal muscle	02	02	00	04	04%
17	CNS	02	02	02	06	06%
18	Eye	02	00	00	02	02%
GRAND TOTAL		44	34	22	100	100%

AWARD OF DEGREE:

A certificate to be called —M.Phil in Pathology under the seal of Liaquat University of Medical & Health Sciences will be awarded to each successful candidate in the Annual Convocation.

TUTION FEES AND STIPEND:

- ❖ As per University rules and regulations.

APPLICATIONS:

- ❖ Applications may be sent on prescribed form, as per University rules.

COURSE OUTLINES
COURSE OUT LINES M.Phil – Part – I
GENERAL PATHOLOGY (MINOR & COMPULSORY)

1. CELL INJURY, ADAPTATION & CELL DEATH

1. Introduction, Causes & Definitions
2. Mechanisms of reversible & irreversible injury
3. Sub cellular changes due to cell injury.
4. Cell Death. Necrosis and Apoptosis
5. Intracellular accumulation: Water, Lipids, glycogen & Proteins and Pigments.
6. Calcification, Hyaline change.
7. Cellular Adaptation: Atrophy, Hypertrophy, Hyperplasia and Metaplasia.
8. Cellular Aging.

2. ACUTE & CHRONIC INFLAMMATION

1. Introduction, Definition and General features of Inflammation.
2. Acute inflammation: Sequence of events.
3. Chemical Mediators of inflammation
4. Outcome of inflammation
5. Chronic inflammation.
6. Morphological types of Acute and chronic inflammation.

3. TISSUE RENEWAL, REGENERATION & REPAIR

1. Control of normal cell proliferation and tissue growth
2. Cell cycle and regulation of cell replication
3. Mechanism of tissue and organ regeneration
4. Extracellular matrix and cell-matrix interactions
5. Healing by repair-scar formation and fibrosis.

4. HAEMODYNAMIC DISORDER & THROMBOEMBOLIC DISEASE & SHOCK

1. Edema
2. Hyperemia, Congestion & Hemorrhages
3. Normal Hemostasis & Thrombosis
4. Embolism
5. Infarction
6. Shock

5. GENETIC DISEASES

1. Genes and human diseases
2. Mendelian disorders
3. Complex multigenic disorders
4. Chromosomal diseases
5. Single gene disease with non classic inheritance.
6. Molecular diagnosis of genetic diseases

6. DISEASES OF IMMUNE SYSTEM

1. The normal immune response
2. Hyper sensitivity disorders
3. Autoimmune disorders
4. Rejection of tissue transplant
5. Immunodeficiency Syndrome

7. NEOPLASIA

1. Nomenclature
2. Characteristic of Benign & Malignant tumor
3. Spread of malignant tumor
4. Epidemiology of cancer
5. Molecular basis of cancer.
6. Etiology of cancer.
7. Grading and staging of cancer.
8. Laboratory Diagnosis of neoplasia

8. INFECTIOUS DISEASES

1. General Principles of Microbial Pathogenesis.
2. Transmission and Dissemination of Microbes.
3. How microorganisms cause disease. Mechanisms of Viral, bacterial injury.
4. New and emerging infectious diseases and Special techniques for diagnosis of infectious agents.

9. ENVIRONMENTAL AND NUTRITIONAL PATHOLOGY.

1. Introduction of occupational and environmental diseases and mechanisms of toxicity.
2. Common environmental and occupational Exposure
3. Nutrition and disease.
4. Obesity, Diet and diseases.

10. DISEASES OF INFANCY AND CHILDHOOD

1. Congenital Anomalies.
2. Disorders of prematurity
3. Perinatal infections
4. Inborn errors of metabolism and other genetic diseases
5. Tumours and tumour like conditions.

M. Phil Part-I
SYSTEMIC PATHOLOGY MAJOR SUBJECT

1. GASTROINTERSTINAL TRACT

- 1- Diseases of Esophagus
- 2- Diseases of Stomach
- 3- Diseases of intestine
- 4- Appendix and Peritoneum

2. THE KIDNEY

- 1- Introduction.
- 2- Congenital anomalies and cystic diseases of the Kidney
- 3- Glomerular diseases.
- 4- Diseases affecting tubules and interstitium
- 5- Diseases of blood vessels.
- 6- Obstructive uropathy & urolithiasis,
- 7- Tumors of the kidney.

3. FEMALE GENITAL TACT

- 1- Embryology, Anatomy and Infections of the Female Genital Tract
- 2- Benign Lesions of Vulva
- 3- Premalignant and Malignant Neoplasm's of Vulva
- 4- Congenital Anomalies Premaligant and Malignant Neoplasma of Vagina
- 5- Inflammations and polyps of cervix
- 6- Cervical intra-epithelial Neoplasia
- 7- Squamous Cell Carcinoma cervix
- 8- Endometrial Histology in the Menstrual Cycle and Functional Endometrial Disorders
- 9- Chronic Endometritis, Endometriosis, Adenomyosis and Endometrial Polyps
- 10- Endometrial Hyperplasia and Malignant Tumors of Endometrium.
- 11- Tumors of Myometrium
- 12- Non Neoplastic and Functional Cysts Ovary
- 13- Tumors of Mullerian Epithelium
- 14- Germ Cells, Sex Cord – Stromal Tumors (Ovary)
- 15- Gestational and Placental Disorders.

4. THE BREAST

- 1- Introduction – Histology, Physiological changes
- 2- Benign lesions of Breast
- 3- Carcinoma of the breast --- incidence, epidemiology
- 4- Etiology and Pathogenesis
- 5- Classification of Breast carcinoma
- 6- Stromal tumors
- 7- The male Breast

5. THE SKIN

- 1- Introduction
- 2- Disorders of pigmentation and melanocytes.
- 3- Benign epithelial tumors
- 4- Pre-malignant and malignant epidermal tumors
- 5- Tumors of the Dermis
- 6- Skin - Acute and chronic inflammatory lesions.
- 7- Dermatoses + infection and infestation.

6. LYMPH NODES

- 1- Introduction
- 2- Lymphadenitis
- 3- Lymphoid Neoplasms—Definitions, classifications & Hodgkin Lymphoma
- 4- Non Hodgkin Lymphoma

7. LIVER AND BILIARY TRACT

The Liver

- 1- Introduction
- 2- Infectious disorders + Drug and toxin – induced liver disease
- 3- Metabolic liver disease.
- 4- Intrahepatic Biliary tract Diseases (including liver cysts)
- 5- Circulatory disorders.
- 6- Hepatic disease associated with pregnancy
- 7- Hepatic complications of organ or bone marrow Transplantation.

8- Nodules and Tumors

The Biliary tract

1- Benign Lesions

2- Tumors.

8. THE PANCREAS

1- Introduction + Pancreatitis + non neoplastic cysts.

2- Neoplasms.

M. Phil Part-II

SYSTEMIC PATHOLOGY (MAJOR SUBJECT)

1. BLOOD VESSELS

- 1- Vascular Wall Cells and Their Response To Injury
- 2- Congenital Anomalies, Arteriosclerosis.
- 3- Hypertensive Vascular Disease
- 4- Aneurysms and Dissections
- 5- Inflammatory vascular Disease
- 6- Veins and Lymphatics abnormalities
- 7- Tumors
- 8- Pathology Of Vascular Interventions

2. THE HEART

- 1- Myocardium, Blood Supply, Valves & effects of aging.
- 2- Heart failure
- 3- Congenital Heart Disease
- 4- Ischemic Heart Disease
- 5- Hypertensive Heart Disease
- 6- Valvular Heart Disease and Endocarditis.
- 7- Cardiomyopathies
- 8- Pericardial Disease
- 9- Tumors

3. THE LUNG

- 1- Congenital Anomalies, collapse and acute lung injury.
- 2- Obstructive Pulmonary Diseases
- 3- Diffuse interstitial (restrictive, infiltrative) Diseases - Fibrosing and Granulomatous . Diseases
- 4- Pulmonary Eosinophilia & Smoking – Related Interstitial Diseases
- 5- Diseases of Vascular Origin
- 6- Acute Pneumonias
- 7- Atypical,& Nosocomial (Pneumonias)
- 8- Lung Abscess & chronic Pneumonias

9- Tumors

10- Pleural Effusion & Pneumothorax

4. HEAD AND NECK

1- Benign Lesions. Of Oral Cavity

2- Tumors and Precancerous Lesions of Oral Cavity.

3- Inflammatory lesion of Nose and Nasopharynx.

4- Tumors of the Nose, Sinuses, Nasopharynx and Larynx.

5- Ear

6- Neck

7- Salivary Glands Tumors

5. THE LOWER URINARY TRACT

1- Introduction

2- Ureters----- congenital anomalies, inflammations & Tumors

3- Urinary Bladder and urethra.

6. THE MALE GENITAL TRACT

1- Introduction

2- Penis

3- Testis and epididymis—Benign lesions.

4- Testis and epididymis Tumors.

5- Prostate --- introduction and Benign lesions

6- Prostate --- Tumors.

7. THE ENDOCRINE SYSTEM

1- Introduction.

2- Pituitary gland.

3- Thyroid gland.

4- Para thyroid glands.

5- Pancreas.

6- Adrenal glands

8. BONES JOINTS AND SOFT TISSUE TUMORS

1- Introduction

2- Osteoporosis + Rickets + osteomalacia

- 3- Osteomyelitis
- 4- Bone tumors and tumor like lesions
- 5- Osteoarthritis + rheumatoid arthritis + infectious arthritis
- 6- Soft tissue benign tumors
- 7- Soft tissue malignant tumors

9. PERIPHERAL NERVE SKELETAL MUSCLE

- 1- Introduction
- 2- Inflammatory lesion
- 3- Diseases of peripheral nerve
- 4- Diseases of skeletal muscle

10. THE CENTRAL NERVOUS SYSTEM

- 1- Introduction
- 2- Benign lesions
- 3- Tumors

11. THE EYE

- 1- Introduction.
- 2- Benign lesions
- 3- Malignant lesions

Core Competencies

The practical skills which a specialist must have are varied. A complete list of the same necessary for trainees and trainers is given below. It is arranged year wise and the level of competence to be achieved each year is arranged as follows. Able to teach the undergraduate, postgraduate students and health professionals and training of paramedics.

- Observe Status
- Assistant Status
- Performed under direct supervision
- Performed indirect supervision
- Performed independently

COMPETENCY LEVELS IN DIAGNOSIS & MANAGEMENT OF HISTOPATHOLOGICAL DISORDERS

- Basic Histopathological laboratory Techniques
- Collection of various Histopathological samples Fixatives
- Buffers
- Instruments used in processing of sections taken from specimen
Procedure for processing the sections
- Role of Xylene, Alcohol and Paraffin Different
Basic Histochemical Stains Different Special
Histochemical Stains Fine Needle Aspiration
(FNA)
- Immunohistochemical Techniques and Markers Frozen
section technique
- PCR

AVAILABLE DIAGNOSTIC FACILITIES

HISTOPATHOLOGY & CYTOLOGY

i. SPECIMEN /BIOPSIES FOR SURGICAL PATHOLOGY.

a) Haematoxylin & Eosin staining

b) Special stains

1. PAS stain
2. Trichrome stain
3. Reticulin stain
4. Giemsa's stain
5. Z. N Stain
6. PAP stain

IMMUNOHISTOCHEMISTRY MARKERS:

- 01 — ER
- 02 — PR
- 03 — C-erb2
- 04 — LCA (CD45) (T-cell)
- 05 — Pan B (CD20) (B-cell)
- 06 — CD03
- 07 — CD05
- 08 — Ki-1 (CD30)
- 09 — CD138
- 10 — CAKE1/AE3
- 11 — CK7
- 12. CK5/6
- 13. CK19
- 14. CK19
- 15. TTF-1
- 16. HMB45
- 17. S-100
- 18. CD-33 Desmin
- 19. CD-117
- 20. E-Cadherin

21. Vimentin
22. CD-34
23. Cycline D1
24. TDT
25. CD19
26. MUM-1
27. BCL-6
28. CD07 T-Cell Lymphoma
29. MPO
30. CD-10
31. CD-15
32. ZAP 70
33. BCL-2
34. CD-79a
35. CD23
36. Myogenin
37. PLAP
38. CD-1a
39. Caldesmon
40. Ki-67
41. P63 Pro
42. EMA
43. Inhibin
44. CD20
45. ASMA
46. PSMA
47. CD2-X
48. Synaptophysin
49. CK8/18
50. Beta Catenin
51. Calretinine

- 52. GFAP
- 53. Hepper 1
- 54. CK20
- 55. CD68
- 56. CD138

SPECIAL STAINING

- 01 PAS
- 02 PASD
- 03 AB-PASD
- 04 TRICHROME
- 05 RETICULIN
- 06 GIEMSA

ii. CYTOPATHOLOGY

- a) Exfoliative Cytology
- b) Fine Needle Aspiration Cytology
- c) Fluid Cytology
- d) PAP Smears Cytology

TEACHING FACULTY/STAFF IN THE DEPARTMENT OF PATHOLOGY:

<u>VICE CHANCELLOR / PROFESSOR</u>	
01	Prof. Ikram Din Ujjan (MBBS, M.Phil., Ph.D., FCPS – Haematology)
<u>CHAIRMAN / PROFESSOR</u>	
02	Prof. Abid Hussain Chang (MBBS, M.Phil. – Microbiology)
<u>PROFESSORS</u>	
03	Dr. Kiran Aamir (MBBS, FCPS – Haematology)
04	Dr. Abdul Aziz Shaikh (MBBS, M.Phil. – Histopathology)
<u>ASSOCIATE PROFESSORS</u>	
05	Dr. Muhammad Rahil Khan (MBBS, FCPS – Histopathology)
06	Dr. Naila Shaikh (MBBS, M.Phil., Ph.D. – Molecular Biology)
07	Dr. Arshi Naz (B.Sc., M.Sc., M.Phil., Ph.D. – Biochemistry)
08	Dr. Nazia Hafeez (MBBS, FCPS – Haematology)
<u>ASSISTANT PROFESSORS</u>	
09	Dr. Zahida Shaikh (MBBS, M.Phil. – Microbiology)
10	Dr. Abdul Rehman Khalil Shaikh (MBBS, M.Phil., Ph.D. – Haematology)
11	Dr. Yusra Shafquat (MBBS, FCPS – Microbiology)
12	Dr. Faheem Memon (MBBS, M.Phil., Ph.D. – Haematology)
13	Dr. Furqan Ahmed Bhatti (MBBS, M.Phil., Ph.D. – Virology)
14	Dr. Sidra Qadir (MBBS, FCPS – Haematology)
15	Dr. Zahid Ali Nohri (MBBS, FCPS – Histopathology)
<u>LECTURERS</u>	
16	Dr. Khalid Yousuf Memon (MBBS, DCP, M.Phil. – Haematology)
17	Dr. Shabnam Rustamani (MBBS, DCP, M.Phil. – Haematology)
18	Dr. Muhammad Ali Memon (MBBS)
19	Dr. Sorath Sindhu (MBBS, M.Phil. – Histopathology)
20	Dr. Rameez Iqbal Memon (MBBS, M.Phil. – Haematology)
21	Dr. Yasmeen Bhutto (MBBS)
22	Dr. Elaf Rasool (MBBS)
23	Dr. Sharique Ahmed Khan (MBBS)
24	Dr. Hina Khokhar (MBBS)

POST GRADUATE TEACHING FACILITIES AVAILABLE

1.	TELE-PROMAR WITH TRANSFORMER (LEITZ)	=	01
2.	TELEVISION SONY TRINITRON	=	01
3.	NIKON MICROSCOPE (BINOCULAR)	=	03
4.	NIKON TWO HEADED MICROSCOPE WITH FLOURSCENCE & DARK FIELD ATTACHMENT	=	01
5.	MULTI-HEADED MIRCROSCOPE (FIVE OBSERVERS)	=	01
6.	INVERTED MICROSCOPE	=	01
7.	EPIDOSCOPE	=	02
8.	SCREEN	=	01
9.	BOOK SHELVES	=	02
10.	TRINOCULAR MICROSCOPE (TWO OBSERVERS)	=	01
11.	TRINOCULAR MICROSCOPE WITH ATTACHED DIGITAL CAMERA, SOFTWARE, PC & MONITOR	=	01
12.	ZOME-STEREO MICROSCOPE	=	01
13.	MULTIMEDIA PROJECTOR WITH ATTACHED LAPTOP	=	01
14.	OVERHEAD PROJECTOR	=	02
15.	SLIDE PROJECTOR	=	02
16.	EPIDIASCOPE	=	02
17.	MOTORIZED SCREEN	=	02

DEPARTMENTAL LIBRARY FACILITY

BOOKS IN SHELF - 01

1. FISHER CATALOGUE 70	=	01
2. LABORATORIES SUPPLIES SCIENTIFIC EQUIP:	=	03
3. CATALOGUE 200 LABORATORY APPARATUS EQUIP	=	01
4. CATALOGUE 80/82	=	01
5. FISHER CHEMICAL INDEX 71C	=	01
6. CHEMICAL LAB APPARATUS CATOLOGY 56S	=	01
7. GERMAN SCIENTIFIC SUPPLIES	=	01
8. MODREN LAB EQUIP:	=	01
9. GENERAL CATALOGUE	=	02
10. FISHER MODREN LAB: EQUIP:	=	01
11. GRIFFIN LAB: EQUIPMENTS:	=	01
12. LAB: CHEMICALS	=	02
13. SCHACHARDT MUNCHON KATOLOG	=	01
14. BDH LAB: CHEMICALS CATOLOGY	=	01
15. THE LCIMBLE COTOLOGUE OF LAB: GLASSWARE	=	01
16. BDH LAB CHEMICALS	=	01
17. GENCO INSTRUEMENTS FOR LAB: SCIENCES	=	01
18. LAB: EQUIPMENT AND SCIENTIFICS APPARATUS	=	01
19. GENERAL APPARATUS, AND MEDICAL SCIENCES	=	01
20. CLINICAL MATHODS IN SURGERY K.DAS	=	01
21. COMMUNITY MEDICINE VIVA	=	01
22. THE GLAXO VOLUME	=	07
23. THE JANERAL SOCIETY OF MEDINCE	=	01
24. MEDICAL PERFERNCE LIST	=	03
25. LAB: EQUIPMENT	=	03
26. MEDINCE GOLWALLA	=	01
27. TURTOX BIOLOGICAL SUPPLIES	=	01
28. GALLEN LCAMP	=	01
29. SCIENTIFIC SUPPLIES CATOLOGY	=	01

30. MEDINCE DAVIDSON`S	=	01
31. GERMAN SCIENTIFIC SUPPLIES	=	01
32. ZEISS INFORMATION	=	32
33. JOURNAL OF THE PAKISTAN MEDICAL ASSOCTION	=	06
34. NEWS AND REVIEW	=	12
35. THE JOURNAL OF THE PAKISTAN MEDICAL ASSOCTION	=	97
36. SCIENTIFIC TECHNICAL SUPPLIES	=	01
37. WORD HEALTH	=	06
38. JPMA	=	04

BOOKS IN SHELF - 02

1. MORCLC DIAGNOSTIC MATERIAL	=	34
2. PAKISTAN MEDICAL FORUM	=	14
3. COLLEGE OF AMERICAN PATHOLOGIST	=	36
4. JENA REVIEW	=	13
5. BULLETIN OF WEST ZONE	=	14
6. RAWAL MEDICAL JOURNAL	=	11
7. PAKISTAN MEDICAL REVIEW	=	08
8. THE MEDICAL	=	09
9. TRIANGLE THE SANDOZ JOURNAL OF MEDICAL SCIENCES	=	04
10. PAKISTAN JOURNAL OF MEDICAL RESARCH	=	08
11. PAKISTAN JOURNAL OF MEDICAL RESARCH	=	05
12. MISLL PRINT MATERIAL	=	17
13. BIO CHEMICAL REAGENT CATOLOGUE	=	28
14. INSTRUMENT CATALGUE	=	28
15. HAEMOTOLOGY	=	07

1.	The Journal of Pakistan Medical Association.	87
2.	Medical Progress Journal.	10
3.	The Journal of American Medical Association.	08
4.	M I S L.	23
5.	R A W A L, Journal of the Pakistan Medical Association,	26
6.	Catalogues.	17
7.	International Journal.	12
8.	General Pathology- Clinically correlated by Mohammad Firdous.	01
9.	Physiological Chemistry by Harper.	01
10.	Text book of Pathology by William Boyd.	
11.	Liaquat Medical College Magazine.	07
12.	Cancer treatment by Amanullah Khan.	
13.	Biochemical organic compounds for research and Diagnostic Reagents.	01
14.	Skin and systemic Disease Vol (I)	01
15.	Churchil Livingstone Catalogue	14
16.	Medical Sindhi literature	17
17.	Souvenirs	35
18.	College of Physicians and surgeons of Pakistan	16
19.	Society of Obstetricians and Gynaecologists of Pakistan	16
20.	Annals of Saudi Medicine	05

D. PATHOLOGY MUSEUM:
MUSEUM SPECIMENS

SPECIMEN	DESCRIPTION
----------	-------------

SMALL INTESTINE	Stricture, Lymphoma, (2) Typhoid ulcer Polyps Millitary Tuberculosis Adenocarcinoma Intussusception, (2) Chronic Peptic ulcer Ulcer cancer Infiltrative carcinoma carcinoma intestine Amoebic ulcer. (2)
COLON	Ulcerative carcinoma
APPENDIX	Acute appendicitis with faecolith.
STOMACH	Trichobezoar Phytobezoar Carcinoma Pyloric end Carcinoma (2) Pyloric stenosis Carcinoma of stomach linitus plastica with pyloric stenosis
LIVER	Hydatid cyst of liver Congenital cyst (2) Honeycomb liver (Autolytic change Liver abscess.
SPLEEN	Ruptured Enlarged spleen (4)
GALL BLADDER	Gall stone + cholecystitis Chronic cholecystitis
HYDETID CYST	Calcified (2)
KIDNEY	Acute nephritis, Hydronephrosis + stone (5) Chronic nephritis (contracted) (2) End stage contracted kidney. Congenital cyst Pyelonephritis chronic (4) Wilm`s tumor Renal cell carcinoma, Clear cell carcinoma.

LUNG	Anthracosis (3) Lung Tuberculosis Carcinoma lung Bronchiectesis (3) Lobar Pneumonia (3)
HEART	Normal Fibrinous Pericarditis (2)
VESSEL	Syphilitic Aortitis (2) Aorta atherosclerosis (3)
THYROID	Colloid goitre (3) Colloid adenoma Thyroid carcinoma Thyroid multinodular goitre
TESTES	Seminoma (4) Embryonal carcinoma (2)
UTERUS	Adenocarcinoma (2) Leiomyoma (4) Degenerated leiomyoma Leiomyoma with cystic degeneration Bicormute uterus Uterus Leiomymatous Polyps Fibroid uterus carcinoma endometrium Endometrial Polyps Choriocarcinoma Gangerinus Polyps endometrium Fallopian tubes (Ectopic pregnancy)
OVARY	Papillary cystadenocarcinoma Adenocarcionoma (4) Ovarian choclate cyst Adherent Placenta Ovarian abscess Mncinous cystadenoma Ovary cystadenoma, mixed, serous & mucinous Ectopic pregnancy Adenoma of Ovary (3) Granulosa cell tumor ovary (2) Ovary cystadenocarcinoma Ovary serous cystadenoma Ovary cyst fibroadenoma Ovary mucinous cystadenoma

BREAST	Breast duct cell carcinoma Breast carcinoma (2) Breast scirrhus carcinoma Fungating breast carcinoma Breast cystosarcomaphyllodes. (Benign), Giant fibroadenoma Fibroadenoma
PENIS	Squamous cell carcinoma (2)
SKIN	Sebaceous cyst Skin (wart) Skin multiple sebaceous cyst Malignant melanoma (3) Dermato fibrosarcoma Papillary cyst Dermoid cyst
FOOT	Medura of food Foot sarcoma Mycetoma
BONE	Osteochondroma Giant cells tumor of bone Osteogenic sarcoma (2) Bone osteoclastoma Chondrosarcoma
MUSCLE	Rhabdomyosarcoma
SOFT TISSUE	Lipoma
LYMPH NODE	Tuberculosis lymph node Lymphoma Hodgkins disease Malignant Lymphoma
FINGER	Osteoclastoma of finger
EYE	Retinoblastoma
URINARY BLADDER	Papillary carcinoma
PARASITE	Tape worms Round worms

DIAGNOSTIC LABORATORIES:

DIAGNOSTIC AND RESEARCH LABORATORY HYDERABAD

EQUIPMENTS

1.	CHEMISTRY ANALYSER (HITACHI- 902)	=	01
2.	CHEMISTRY ANALYSER (COBAS MIRA)	=	01
3.	CHEMISTRY ANALYSER (TECHNO 168)	=	01
4.	CHEMISTRY ANALYSER (Photometer 4010)	=	01
5.	ELECTROLYTE ANALYSER (BIOLYTE)	=	01
6.	CHEMISTRY / ELISA ANALYSER (Chem Well)	=	01
7.	AUTOMATED ELECTROPHORESIS (GENIO)	=	01
8.	HAEMATOLOGY ANALYSER (SYSMEX 9500)	=	01
9.	HAEMATOLOGY ANALYSER (SYSMEX KX-21)	=	01
10.	BLOOD CELL SEPARATOR (HAEMONETICS)	=	01
11.	PLATELET AGITATOR	=	01
12.	INCUBATOR	=	01
13.	OVEN	=	01
14.	BLOOD BANK UNIT	=	01
15.	CENRIFUGE MACHINE	=	01
16.	MICROSCOPE (BINOCULAR)	=	03
17.	REFRIGERATOR	=	01
18.	DEEP FREEZER	=	03
19.	ESR STAND	=	02
20.	ESR PIPETTES	=	30
21.	GLASS PIPETTES	=	25
22.	PIPETTE STAND	=	02
23.	TUBE RACKS	=	05
24.	JUSTER (2 SETS)	=	07
25.	JUSTER STAND	=	01
26.	STOP WATCH	=	01
27.	UPS (WHOLE LAB REQUIRMENT)	=	01

28.	GENERATOR	=	01
29.	COMPUTER (Pentium – IV)	=	04
30.	PRINTER (Dot matrix)	=	03
31.	PRINTER (LASERJET)	=	02
32.	SPIT A/C	=	05
33.	STABILIZER	=	03
34.	BLOOD GAS ANALYZER	=	01
a)	H/E STAINING SET	=	01
b)	PAP STAINING SET	=	01
c)	LEISHMAN’S STAINING SET	=	01

AT DEPARTMENT OF PATHOLOGY JAMSHORO CAMPUS

HEMATOLOGY DIAGNOSTIC LAB

EQUIPMENTS

1.	MICROSCOPE (BINOCULAR)	=	02
2.	OVEN	=	01
3.	COMPUTER WITH ACCESSORIES	=	01
4.	PRINTER	=	01
5.	HB METER (SAHLI)	=	05
6.	WEIGHING MACHINE	=	01
7.	NEUBAR COUNTING CHAMBER	=	02
8.	ESR PIPETTES	=	20
9.	RBC PIPETTES	=	05
10.	WBC PIPETTES	=	05
11.	HB PIPETTES	=	05
12.	ESR STAND	=	02
13.	TIMER	=	01
14.	STAINING STAND	=	01

HISTOPATHOLOGY DIAGNOSTIC LAB:

EQUIPMENTS

1.	TISSUE PROCESSOR	=	02
2.	CRYTOME	=	01
3.	ROTATORY MICROTOME	=	02
4.	ELECTRONIC MICROTOME	=	01
5.	TISSUE BATH	=	02
6.	HOT PLATE	=	02
7.	INCUBATOR	=	01
8.	COMPUTER WITH ACCESSORIES	=	01
9.	PRINTER (HP 5L)	=	01
10.	REFRIGERATOR	=	01
11.	AIR CONDITIONER	=	01
12.	KNIFE SHARPNER	=	01
13.	STAINING RACKS		
a)	H/E STAINING SET	=	01
b)	PAP STAINING SET	=	01
c)	GIEMSA STAINING SET	=	01
d)	PAS STAINING SET	=	01
e)	CONGO RED STAINING SET	=	01
f)	SILVER TRICHROME STAIN	=	01
g)	SUDAN BLACK STAIN	=	01
h)	CONGO RED STAIN	=	01
i)	GIEMSA STAIN	=	01
j)	Z. N. STAIN	=	01
14.	BLOCK FRAME	=	12 PAIRS
15.	DIAMOND PENCIL	=	02
16.	BURNER	=	02
17.	MOULDS	=	10

MICROBIOLOGY DIAGNOSTIC LAB

EQUIPMENTS

1.	INCUBATOR	=	01
2.	AUTOCLAVE	=	01
3.	OVEN	=	01
4.	MICROSCOPE (BINOCULAR)	=	01
5.	COLONY COUNTER	=	01
6.	STAINING RACK	=	10
7.	BURNERS	=	02
8.	WIRE LOOPS	=	05
9.	DEEP FREEZER	=	01
10.	REFRIGERATOR	=	01
11.	WEIGHING MACHINE	=	01
12.	ANAEROBIC JAR	=	01
13.	MACNTOSH JAR	=	01

CHEMICAL PATHOLOGY DIAGNOSTIC LAB

INSTRUMENTS

QUANTITY

PHOTOMETER 4010	=	02
PRINTER	=	01
WATER BATH	=	02
PUMP	=	02
FP.901 CHEMISTRY ANALYZER (LAB: SYSTEM)	=	01
FP.910 COAGULATION ANALYZER (LAB: SYSTEM)	=	01
FP. 401 INCUBATOR (LAB: SYSTEM)	=	01
FP. 410 INCUBATOR (LAB: SYSTEM)	=	01
PHOTO ELECTRIC COLORIMETET AE-II	=	02

CENTRIFUGE MACHINE	=	03
FINNI PIPETTES (JUSTERS)	=	31
MICROSCOPE (OLYMPUS) MONOCULAR	=	01
ELECTRO PHORESIS (SHANDAN)	=	01
AIRCONDITIONER WITH STABILIZER	=	01
DEEPPREZER WITH STABILIZER	=	01
U.P.S.	=	04
ELECTRIC WEIGHING MATCHINE	=	01
UNISKAN II (LAB: SYSTEM)	=	01
UNISKAN II (LAB: SYSTEM)	=	01
FLAME PHOTOMETER 410C	=	01
FLAME PHOTOMETER 410	=	01
INCUBATOR	=	01
HOT AIR OVEN	=	01
PIPETTE STAND	=	03
AUTOMATIC PIPETTE STAND	=	01
MICRO CO2 APPARATUS	=	01
REFRIGERATOR / DEEP FREZERS		

AVAILABLE DIAGNOSTIC FACILITIES

HISTOPATHOLOGY & CYTOLOGY

1. SPECIMENS / BIOPSIES FOR SURGICAL PATHOLOGY.

- (a) H & E Stain
- (b) PAS stain
- (c) Silver trichrome stain
- (d) Congo Red Stain
- (e) Sudan Black Stain
- (f) Giemsa Stain
- (g) Z. N. Stain

2. CYTOLOGY

- (a) Exfoliative cytology
- (b) F. N. A. C
- (c) Fluid
- (d) Post coital Smear

2. BIO-CHEMISTRY

- | | |
|---------------------------------|-----------------------------------|
| 1. Acid phosphatase group | 33. Semen Analysis |
| 2. Acid phosphatase total | 34. Serum Electrolytes |
| 3. Acid phosphatase prostatic | 35. Sodium |
| 4. Aldolase | 36. SGOT |
| 5. Alkaline phosphatase | 37. SGPT |
| 6. Alpha HBDH | 38. Sperm Antibody (Auto) |
| 7. Amylase | 39. Sperm Antibody (Wife's) |
| 8. Bence Jones Protein | 40. Stool Fat Globules |
| 9. Bicarbonate | 41. Stool Occult Blood |
| 10. Bilirubin group | 42. Stool Reducing Sugar |
| 11. Direct Bilirubin | 43. Sweat Chloride |
| 12. Drug cortisol (Elisa) | 44. Total Lipids |
| 13. Gamma GT | 45. Total Protein Group |
| 14. G.6PD | 46. Triglycerides |
| 15. Glucose challenge Test | 47. Urine microalbumin |
| 16. Glucose Fasting | 48. Uric Acid |
| 17. Glucose Random | 49. Urine Albumin |
| 18. HDL | 50. Urine Amylase |
| 19. Iron / TIBC | 51. Urine Bile Pigment |
| 20. LDH | 52. Urine Bile Salts |
| 21. LDL | 53. Urine Calcium |
| 22. Lipase | 54. Urine Chloride |
| 23. Lipid Profile | 55. Urine Cortisol (Elisa) |
| 24. Lipoprotein Electrophoresis | 56. Urine magnesium |
| 25. Lithium | 57. Urine pH |
| 26. Liver Profile | 58. Urine phosphorus |
| 27. Magnesium | 59. Urine Protein Electrophoresis |
| 28. Occult Blood | 60. Urine Protein |
| 29. Phosphorus | 61. Urine reducing substances |
| 30. Protein Electrophoresis | 62. Urine Sodium |
| 31. Renin | 63. Urine Urea |
| 32. Salmonella typhidot | 64. Urine urea-Nitrogen |

3. MICROBIOLOGY

- | | |
|----------------------------------|-----------------------------------|
| 1. AFB Smear | 8. Fungus Smear / KOH Preparation |
| 2. AFB Culture | 9. Gram-staining |
| 3. Anaerobic Culture | 10. Parasitic Identification |
| 4. Aerobic Culture | 11. Scrapping |
| 5. Blood Culture | |
| 6. Flourescent Treponeantibodies | |
| 7. Fungus Culture | |

4. HAEMATOLOGY:

- | | |
|----------------------------------|-------------------------------|
| 1. Absolute Eosinophils count | 11. Hb Electrophoresis |
| 2. APTT | 12. Malarial Parasite |
| 3. Bleeding Time | 13. Osmotic Fragility Test |
| 4. Donor work Platelet Emergency | 14. Peripheral Blood Film |
| 5. Donor work platelet pharesis | 15. Platelet counts |
| 6. ESR | 16. Prothrombin Time |
| 7. Hemoglobin F | 17. RBC Morphology |
| 8. Hemoglobin | 18. Sputum for Eosinophils |
| 9. Hematocrit | 19. Total Glycated Hemoglobin |
| 10. HbA1C | 20. White Blood Cell Count |

5. ELISA TECHNIQUE

- | | |
|------------------------------------|------------------------------------|
| 1. Alpha Fetoprotein | 23. Hepatitis E. Virus |
| 2. Amoebiasis – EHA | 24. Hepatitis profile |
| 3. ANA Groups Test | 25. Hepatitis B Profile |
| 4. Anti-ds DNA | 26. Hepatitis C Virus |
| 5. Antibody Screening | 27. Herpes Simplex – I – IgM |
| 6. Antibody titre | 28. HIV |
| 7. Beta HCG | 29. HIV – Device |
| 8. Echinococcus Antibodies | 30. Lupus Erythematosus antibodies |
| 9. Ferritin | 31. Parathormone |
| 10. Free T3 | 32. Prostatic Specific |
| 11. Fresh Plasma Screening | 33. Rubella IgG |
| 12. FSH | 34. Rubella IgM |
| 13. Free T4 | 35. T3 |
| 14. Growth Hormone | 36. T4 |
| 15. Helicobacter pylori antibodies | 37. TSH |
| 16. Hepatitis B Core Total | 38. Testosterone |
| 17. Hep. A. antibody IgM | 39. TROCH |
| 18. Hep. B. Surface Antibody | 40. Toxoplasma IgG |
| 19. Hep. B Surface Antigen | 41. Toxoplasma IgM |
| 20. Hep. Be Antibody | 42. Typhidot |
| 21. Hep. Be Antigen | 43. Urine Cortisol |
| 22. Hep. Delta Antibodies | |

6. SEROLOGY/ IMMUNOLOGY

1. Mantoux Test
2. R. A factor with titre
3. Pregnancy Test (Latex)
4. Widal Test
5. **Anti-streptolysin “O”**

