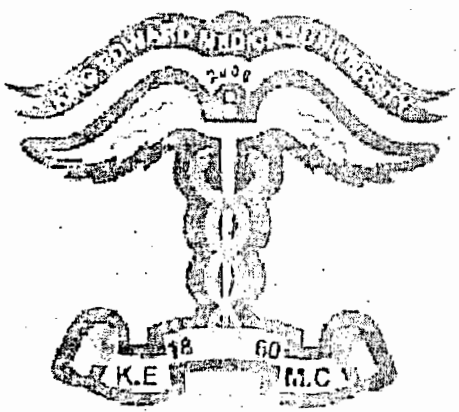
Curriculum of M. Phil Program

in

Morbid Anatomy & Histopathology



2007

King Edward Medical University, Lahore – Pakistan

Registrar,
King Edward Medical University, Lahore

Prologue

by

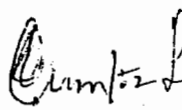
The Honorable Vice Chancellor KEMU

The Program Faculty Committee Members of all M. Phil Programs are guided and assisted in order to enable them to meet the minimum requirements and standards to be achieved. Only principle areas are addressed giving freedom for the students to raise questions and arguments and for the teachers to include most recent and best guidance literature curriculum contents. It is clear that beyond the main framework there are greater challenges in the areas of selecting modern knowledge, translating information into skills, selecting best pedagogy, teaching in the light of different knowledge levels as determined by Blooms Taxonomy, effective communication, making use of best teaching aids, evaluations, counseling and role modeling. Moreover teachers of Postgraduate M. Phil programs have additional responsibilities of keeping into view the community heeds in terms of health care problems in their respective fields. The students in this modern curriculum have more responsibilities to improve their knowledge beyond textbooks and visit libraries and World Wide Web as frequently as possible. Their logical arguments will serve as the backbone of learning process.

The whole curriculum is divided into semesters to facilitate, knowledge delivery and absorption, more effective. Each semester is further subdivided into modules. This will further make the education process smooth.

I remain confident that both faculty and students would enjoy during this program.

I congratulate Chairman M.Phil Coordination Committee, Professor Dr.Attiya Mubarik Khalid and her dedicated team members / Program Directors, who have put in lot of hard work to bring these framework guidelines in its present shape.



Prof. Mumtaz Hassan (S.I.)
MBBS (Pb.) B.Sc. (Pb.) MRCP (UK), DTM&H (Edin)
FCPS (Pak.), FRCP (Lond.), FRCP (Edin), FRCP (Glasg.),
FRCP (Ireland), DM (USA), FACP (USA), FACIP (USA),
FCCP (USA), FAFCA (USA)

Vice Chancellor
King Edward Medical University,
Lahore.

Prologue

by

The Honorable Pro-Vice-Chancellor

KEMU

M.Phil Programs in Basic Medical and Dental Sciences were introduced in Pakistan to create Scientist and Teachers. In absence of PhD programs these programs were equivalent to major qualifications of the Universities. These programs before 2001 were spread over four years, two (2) years of experience of teaching in same subject in recognized medical teaching institution, one (1) year of course work and one (1) year of lab work and research. In 2001 curriculum were revised and all four (4) years were included into the body of the program.

Now PhD programs are promoted, supported, encouraged and funded by Higher Education Commission, largely as M.Phil leading to PhD programs, the M.Phil programs are made equivalent to M.Phil in Engineering, Hard Sciences, Biological Sciences and Social Sciences.

The M.Phil programs based on this framework will have duration of two (2) years at postgraduate level (Level 7 according to the European Education Levels) and will be credit based, modularized, Semesterized during first year and research work during second year. The qualification of M.Phil will be "Medium Qualification" according to "PMDC Criteria" and "Masters (M) qualification according to QAA-UK criteria.

Prof. Dr. Syed Muhammad Awais
(Sitara-e-Imtiaz)
M.B.B.S.(Pb), M.C.P.S.(Surg), M.Sc. Bio-eng. (Dun.), M.S. (Orth)
Pro-Vice Chancellor &
Prof. Orthopaedic Suegery
King Edward Medical University &Mayo Hospital &University,
Lahore.

Prologue

by

The Chairperson M. Phil Program Committee KEMU

M.Phil programs at KEMU not only provide students with an outstanding education but also encourage them to self-directed, theoretical and practical learning. These above mentioned attributes are at the forefront of knowledge in every specialized field that provides a basis for originality in developing and/or applying ideas, often within a research context. The aim of this exercise is to develop conceptual understanding that enables the student; to evaluate critically current research and advanced scholarship in the discipline; and to evaluate methodologies and develop critiques of them and, where appropriate, and to propose new hypotheses.

M.Phil programs at KEMU also recognize and reinforce the ability of students to integrate knowledge and formulate judgments. Students are also directed to take account of social and ethical issues and responsibilities and also reflect experience of managing change in a complex environment. The learning process at this level is associated with independent working with other people at the same level or higher. All feasible efforts will be made by the departments to provide students an opportunity to develop the work or learning according to student's scholastic interest.

During the course of M.Phil training, students will be presented with unfamiliar learning situations and will be required to solve problems that involve many obscure and interacting factors. Many such factors are typically variable, making the learning context complex and unpredictable. The overall impact of these exercises is to; ensure a highly specialized education and its application in problem solving to ensure access to employment requiring decision-making in complex and unpredictable situations and Nurture independent learning ability required for continuing professional development Career progression within the respective field.

Prof. Dr. Attiya Mubarik Khalid,
MBBS, BSc(Eng), M.Phil
Chairperson Anatomy & Histology Deptt.
King Edward Medical University, Lahore.

FOREWORD

M.PHIL PROGRAMM IN HISTOPATHOLOGY
(2006)
KING EDWARD MEDICAL UNIVERSITY LAHORE

Importance of histopathology in establishing diagnosis has been recognized since ages. It is for the last few decades many advances have been made in the form of special stains, immunohistochemistry and immunomarkers with facilitate the diagnosis. Frozen sections and FNAC are new modalities used for early diagnosis.

The present course of M.Phil in histopathology is aimed to well versed to all the participants to know the pathological basis of diseases and also the various techniques used in histological diagnosis.

The main goal in designing this course is to combine the strength of existing knowledge with ever changing techniques in the field of histopathology. By obtaining the core knowledge of this subject, the graduate will be better diagnosticians and research oriented.

DR. IHTESHAM UDDIN QURESHI,
MBBS, D.C.P, M.PHIL (MORBID ANATOMY &HISTOPATHOLOGY)
ASSOCIATE PROF. OF PATHOLOGY,
K.E.MEDICAL UNIVERSITY, LAHORE.

Table of Contents

Sr. No	Section Title	Page No
1	***Introduction***	
2	Morbid Anatomy and Histopathology M. Phil Program Faculty	
3	Program Outline	
4	Admissions	
5	***Curriculum Outline and Learning Schedule***	
6	Year 1 Semester 1 Class Schedule	
7	Course Content, Semester I	
8	Year 1 Semester 2 Class Schedule	
9	Course Content, Semester II	

Introduction

King Edward Medical University (KEMU) is a seat of excellence in promoting biomedical education at all levels and has robust programs at both undergraduate and postgraduate levels. KEMU has the distinction to offer an M.Phil program in Morbid and Histopathology immediately after its inception. KEMU has philosophy of not only enhancing the depth of knowledge of its students but also the breadth. Therefore during the first semester students will be required to take some multidisciplinary classes which are compulsory for all M.Phil Students regardless of their area of specialization. Following is the content of the courses of the M.Phil program in Morbid Anatomy and Histopathology which is offered through Pathology Department.

M. Phil Program Faculty
Morbid Anatomy
&
Histopathology

Dr. IhteshamUd Din Qureshi
Director M. Phil Program
Morbid Anatomy and Histopathology
Prof.Dr. Muhammad Munir,
Chairman,
Department of Pathology,
K.E.Medical University, Lahore.

Prof. Dr. Samina Naeem,
Prof. of Pathology,
K.E.Medical University, Lahore.
Dr. Muhammad Eyyaz Khalil
Dr.Nasir Iqbal
Dr.Tahira Hamid
Dr.S.Mulazim Hussain Bukhari
Dr.Shahida Niazi
Dr.Samina Zaman
Dr.Shahida Rasool

Visiting Faculty

Prof.A.H.Nagi
Prof.Nosheen Yousaf
Dr.Shahzad Shafqat

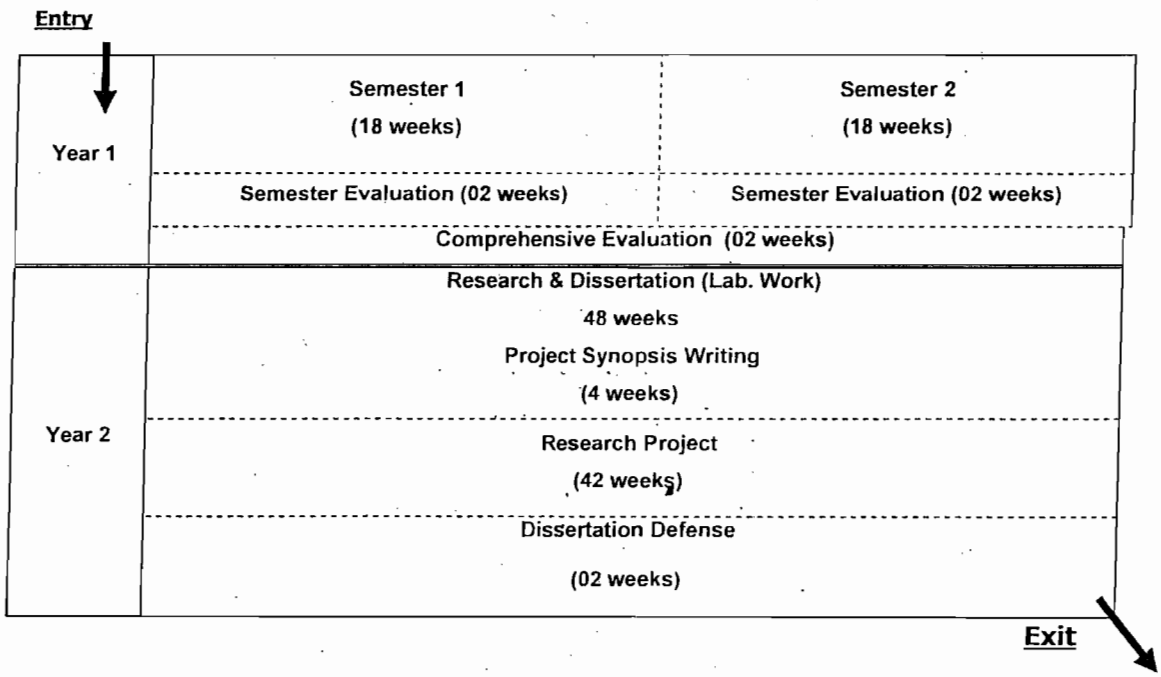
Program Outline

Duration of the Program: 02 Years (Full Time)

Entry Qualifications: MBBS/BDS/B.Sc Hons/M.Sc (minimum 16 years of education).

Entry Procedure: GRE Type Entry Test (MCQ Based)
Written Test at Faculty of Basic Sciences Level
Interview at Department of the Program Level

Phase of Studies in Basic Curriculum:



Year 1 is semesterized into two Semesters of twenty (20) weeks each whereas year two (2) is annual of forty eight (48) weeks. Each module and the whole program is made credit based according to the following criteria.

Credit Accumulation and Transfer System (CATS)

As defined by European Credits Transfer system, the CATS – KEMU is defined as follows

1. Contact Hours 1500 – 1800 hrs/year
2. 25 – 30 Contact Hours = 1 Credit Point
3. Number of Credit Point Required in a Year = 60
4. Number of Credit Point Required in a Semester = 30

Admissions

Candidates applying for M.Phil program will be selected on open merit. Departments will set the criteria for selection within following guidelines.

Admissions Criteria (Adopted from HEC):

Sixteen years of schooling or 4 year education (MBBS/BDS/B.Sc Hons/Equivalent) after F.A. /F.Sc. (130 credit hours) will be compulsory for admission in MPhil Program.

Admissions Procedure:

1) A test equivalent to GRE test will be necessary for admission to M.Phil program. (This test will be conducted on behalf of the "Basic Science Faculty" by the "M.Phil Program Coordination Committee, of KEMU, and will comprise of MCQ as per HEC guidelines).

Sr. No.	01 Subject	Weight
1.	Anatomy	5%
2	Physiology	5%
3	Biochemistry	5%
4	Pharmacology	5%
5	Forensic	5%
6	Molecular Biology	5%
7	Microbiology	5%
8	Histopathology	5%
9	Hematology	5%
10	Chemical Pathology	5%
11	Oral Anatomy & Dental Morphology	5%
12	Oral Pathology	5%
13	Public Health and Preventive Medicine	5%
14	Major Subject	35%
	Total Questions & Marks	**200**
	Pass Marks	**50%**

2) Candidates will also have to demonstrate excellence in their verbal and personal skills in an interview. (The interviews will be conducted by the "Program Faculty Committee", of the program in which student will apply.

3) The admission into the M.Phil program will be on merit basis. The following is credit point distribution, which will be awarded to an applicant based on his/her prior experiences and accomplishments.

Admission Test:	Maximum credit points 20
Viva:	Maximum credit points 20
Additional Experience:	Maximum credit points 10
Education Marks:	Maximum credit points 40
Additional Qualification:	Maximum credit points 10

Curriculum Outline and Learning Schedule

First Year

First Semester (January 15th – May 28th):

Teaching	18 weeks
Review and Evaluation	02 weeks
Total	20 weeks

Summer Recess (May 29th – July 30th)

Second Semester (August 1st – December 20th):

Teaching	18 weeks
Review and Evaluation	02 weeks
Total	20 weeks

Winter Recess (December 21st – January 14th)

Second Year

January 15th – December 20th

Teaching / Lab Work	46 weeks
Dissertation Defense	02 weeks

Year 1 Semester 1

Class Schedule

Module N.o	701	702	703	704	1 week	705	706/707
Duration	2 weeks	2 weeks	2 weeks	2 weeks		5 weeks	3+2 weeks
Title of Module	Introduction To Morbid Anatomy and Histopathology	Research Methods & Biostatistics	Molecular Biology & Genetics	Basic Science	Midterm Evaluation	General Pathology	706 Gastrointestina tract & 707 Liver ,Biliary tract & Pancreas
Module Coordinator	Dr.Ihtesham-Ud-Din Qureshi	Prof. Syed Muhammad Awais	Prof. Fridoon			Prof. Muhammad Munir	Dr.Ihtesham Ud-Din Qureshi
Place of Learning	Department Lecture Room	Patiala Block	Patiala Block	Department Lecture Room		Department Lecture Room	Department Lecture Room

SEMINARS

- Techniques in histopathology.
- Types of Microtomes and their working mechanisms.
- Frozen section techniques.
- Update on FNAC and Cytology.
- Steps of tissue processing.
- Fixatives used in histopathology.
- Utility of special stains, Histochemistry and Immunohistochemistry in a field of histopathology.

PRACTICALS

- Manual processing of tissues.
- Section cutting , staining and mounting of slides.
- Frozen section cutting and reporting.
- Performing and reporting FNAC .
- Smears making and reporting of biological fluids for cytology.
- Preparation of different types of fixatives.

RECOMMENDED BOOKS

- Robbins and Cotran
  Pathologic BASIS OF DISEASE by Kumar Abbas Fausto 7th ed. 2004
- Ackerman's
  Surgical Pathology by Juan Rosai 9th Ed. 2004
- Surgical Pathology by Sternburg 4th Ed.2004
- Cytology by Koss Ed. 2004
- Histological Techniques by Bencroft Ed.2004

COURSE CONTENT

IST SEMESTER

MODULE 701

INTRODUCTION TO HISTOPATHOLOGY
DURATION 2 WEEKS
CREDIT HOURS (3)

LEARNING OBJECTIVES

- Describe historical background of histopathology.
- Enlist limitation of histological diagnosis.
- Enlist laboratory hazards of chemicals used in histopathology lab.
- Enlist precautions taken during tissue processing, cutting and staining.
- Describe the steps of tissue processing.
- Classify the different types of fixatives used in histopathology.
- Enlist the significance of exfoliative cytology.
- Discuss the role of immunohistochemistry in the diagnosis of various tumours.
- Discuss the significance of FNAC in the diagnosis of space occupying lesions.
- Describe the importance of frozen sections in rapid diagnosis of various lesions in histopathology.
- Enlist the role of histopathologist in quality control and assurance.

COURSE CONTENTS

1. Historical perspective
2. Limitations of histological diagnosis
3. Techniques in histopathology
4. Tissue processing , cutting and staining
5. Diagnostic cytology
6. Frozen sections
7. Quality control and assurance
8. Special stains, histochemistry and immunohistiochemistry

Module 702 Research Methods & Biostatistics
(2 Weeks/3 Credit Hours)

Course Description and Learning Objectives:

- To help participants to formulate ideas that can be tested in a scientific manner
- To give participants a basic understanding of epidemiological methods and biostatistics.
- To develop the critical faculties of participants for evaluation of their own and other people's work.
- To give practical experience of development of study protocols and applications for research funding.
- To give practical experience of use of computers for word processing, database manipulation, use of spreadsheets, statistical analysis, preparation of slides and overheads, internet communication and video conferencing and report writing.

Course Contents:

1. Research Methods
   - Philosophy, language, types and structure of Research
   - Conceptualizing research, problem formulation, research objectives
   - Review of literature, sources of knowledge
   - The Planning-Evaluation Cycle
   - Sampling terminology, Probability sampling, Non-probability sampling, Bias and Error
   - Time in Research, Types of Relationships
   - Variables, Hypotheses, Types of Data
   - Introduction to Design, Types of Designs
   - Experimental Design
   - Survey Research, Types of Surveys
   - Qualitative research, Qualitative Data
   - Introduction to Design, Types of Designs, Experimental Design
   - Questionnaires
2. Biostatistics
   - Data display and summary, mean and standard deviation
   - Populations and samples
   - Statements of probability and confidence intervals
   - Differences between means: type I and type II errors and power
   - Differences between percentages and paired alternatives
   - The t tests and the chi-squared tests
   - Correlation and regression
   - Study design and choosing a statistical test

3. Epidemiology
    - What is epidemiology?
    - Quantifying disease in populations
    - Comparing disease rates
    - Measurement error and bias
    - Planning and conducting a survey
    - Ecological studies, Longitudinal studies, Case-control, cross sectional studies and experimental studies
4. Technical Writing
    - Synopsis writing
    - Grant proposal writing
    - Research paper writing
    - Thesis outline
    - Thesis writing

MODULE 703
MOLECULAR CELL BIOLOGY
CREDIT HOURS (3)

Course Description and Learning Objectives:

- This course is the second in the series of two courses designed to introduce both classical and contemporary topics in biology to the students.
- This course is structured to entertain students irrespective of their major.
- After taking this course students will be expected to have a basic understanding of the following fundamental concepts

1. The role of cellular and molecular biology in medicine.
2. Immunology.
3. Molecular and cellular developmental biology ("miracle of life" formation of a complex organism from a single cell).
4. Evolution with a molecular perspective (natural force and their effect in transformation of life).

Course Contents:

1. Recombinant DNA and Biotechnology
2. Molecular Biology and Medicine
3. Natural Defenses against Disease
4. Differential Gene Expression in Development
5. Animal Development: From Genes to Organism
6. Development and Evolutionary Change
7. The History of Life on Earth
8. The Mechanisms of Evolution
9. Species and Their Formation
10. Reconstructing and Using Phylogenies
11. Molecular and Genomic Evolution

RECOMMENDED BOOKS

- Robbins and Cotran
  Pathologic BASIS OF DISEASE by Kumar Abbas Fausto 7th ed. 2004
- Ackerman's
  Surgical Pathology by Juan Rosai 9th Ed. 2004
- Surgical Pathology by Sternburg 4th Ed.2004
- Cytology by Koss Ed. 2004
- Histological Techniques by Bencroft Ed.2004

Module 704

Basic Science
(2 Weeks/3 Credit Hours)

Course Description and Learning Objectives:

- This is a multidisciplinary course that in two weeks gives students basic knowledge of the five pillars of basic medical sciences i.e. Anatomy Physiology Pathology Biochemistry And Course Pharmacology.
- Student taking this course will be able to understand

Course Contents:

Anatomy

1. Embryology
   - Fertilization, Zygote, Morula, Blastula, Gastrula, Embryonic period Derivatives of germ layers
   - Brief account of Amnion, Chorion, Placenta
   - Out line of development of Heart and its Anomalies
   - Brief account of development of Urogenital, Digestive systems
2. Histology
   - Cell,
   - Tissue (Epithelial tissue, Muscular tissue, Connective tissue and Nervous tissue)
   - General plan of microscopic structure of CVS
   - Systems (Respiratory, Urogenital, Digestive systems)
3. General Anatomy
   - Classification of bones, their blood supply and ossification
   - Classification of Joints Nerve Supply and Blood supply
   - Types and Nerve supply of Muscles
   - Definition of Neuron and Peripheral and Central nervous system
   - Surface marking of Heart, Lungs, Abdominal viscera
4. Thorax
   - ***Thoracic cage movements***
   - Heart and its External and Internal features and Blood supply
   - Lungs, Pleura, Mediastinum (Name of contents)
5. Abdomen
   - Disposition of Abdominal and Pelvic viscera
   - Outline of Blood supply
   - Nerve supply and Lymphatic drainage and Peritoneal relation of visceras
6. Head & Neck
   - Bones, Foramina of skull
   - Names of Cranial nerves, Brief outline of 5^{th} & 7^{th} Cranial nerves
   - Dural venous sinuses, Blood supply and Nerve supply (brief account)
   - Nose, Pharynx and Larynx. (Blood supply and Nerve supply)

Physiology

1. Functional organization of the human body and control of the internal environment
2. Extra cellular fluid
3. Homeostasis
4. Dehydration and Rehydration and K+ Homeostasis
5. Anemia, Polycythemia
6. Resistance of body to infection-the leukocytes, tissue macrophage system and inflammation
7. Immunity and allergy
8. Hemostasis and blood coagulation
9. Cardiovascular system properties of cardiac output CCF test cardiac function & Hypertension Normal ECG Acid Base Balance urine formation
10. Respiration Spirometery Regulation Real Electrocardiogram.
11. Body fluids & kidneys; regulation of acid-base balance
12. Pulmonary blood flow
13. The nervous system and special senses.
14. The gastrointestinal tract
15. Metabolism and temperature regulation
16. Endocrinology and reproduction
17. Sports Physiology
18. Ovarian and testicular function tests
19. Thyriod Parathyriod Adrenal pancreas endocrine hypothalamus

Pathology

1. Structure and functions of normal human cell inflammatory reaction, chmical mediators primary and secondary wound healing. Factors affecting the process of healing. Healing in fractured long bone.
2. Gram + Ve orgmisms and lesions produced by them. Cram- Ve orgnanisms and lesions produced by them. Mycobactcrial infections, lesions and laboratory diagnosis. Viral infections like Hepatitis, AIDS, Polio, Hepez, Measels etc. Fungal infections-superficial deep seated and opportunistic. Parasites of medial importance and their lab. Diagnosis such as protozoa, tape worms and round worms
3. Etiology and pathogenesis of thrombosis, complications and diagnosis thrombosis, type, mechanisms of change of various emboli, infarction and its diagnosis.
4. Nomenclature etiology of tumors, benign and malignant tumour , route of spread of malignant Tumour, effects of tumors, oncogens, Tumour suppress genes, tumour markers, and their diagnostic significance, some protype specific Tumour.
5. Pathologic calcifications. Its types and lesions, various exogenous and endogenous pigments and lesions. Deficiency diseases and lesions.
6. Physical irritants and lesions produced by them. Ionizing Radiations and lesions produced by them. Chemical agents as a cause of tissue injury.
7. Rheumatic, ischemic and congenital Heart disease, Endocarditis. Antheroma-its etiology, lesions and complications.
8. Glomeruloncphritis, pyclonephritis, stones renal tumours diabetic Nephropathy.

9. Bronchiectasis, emphysema, pneumonias, tumours, tuberculosis pncumoconiosis.
10. Oesophageal lesions, peptic ulcer, gastritis, tumous of stomach, inflammatory bowel diseases, tuberculosis of intestine,tumours of intestine.
11. Tumours of bones, inflammation of bones and giants, muscle dystrophy important skin lesions and their diagnosis, inflammations and tumours in oral cavity including teeth and jaws.
12. Tumours of C.N.S inflammations of meninges and their lab diagnosis demyelinating diseases.
13. Tumours of lymph nodes and lcukemias, multiple mycloma- lesions and lab diagnosis.

Biochemistry

1. Fluid & Electrolyte & Acid Base Balance in Human Body with select Clinical Scenarios.
   - Constitution of Extra & Intracellular Fluids.
   - Extracellular Fluid Compartments; Select Dehydration & Oedema Development & Management.
   - Intracellular Fluid Compartments; Select Dehydration & Oedema Development & Management.
2. Metabolic Cross Talk in Glycomics. Health & Disease Scenarios.
   - Site, Pathway Dynamics, Key & Regulatory Enzymes, Nutritional & Endocrine Command, Outcome & Clinical Complications in Glycolysis, Hexose Shunt Pathway, Glycogenesis & Glycogenolysis, Kreb's Pathway & Glucuronic Acid Pathway.
3. Metabolic Cross Talk in Lipomics. Health & Disease Scenarios.
   - Site, pathway Dynamics, Key & Regulatory Enzymes, Nutritional & Endocrine Command, Outcome & clinical Complications in Fatty Acid Oxidation & Biosynthesis, Ketosis, Cholestrogenesis & Lipoproteins.
4. Metabolic Cross Talk in Proteomics. Health & Disease Scenarios.
   - Site, pathway Dynamics, Key & Regulatory Enzymes, Nutritional & Endocrine Command, Outcome & clinical Complications in Urea Cycle, Protein Biosynthesis & Select Amino acid Metabolism with Genetic Disorders.
5. The Liver & Biliary System.
   - Liver Functions & Liver Function Tests, Biliary Stasis, Cholecystitis & Pancreatitis, Jaundice.
6. Nutrition & Endocrines Modalities.
   - Basic Nutritional Principles & Calorific Requirements. Diet in health & Disease.
   - Biosynthesis, Storage, Mechanism of Release, Transport, Binding to Receptor, Mode of Activity, Biochemical Functions & Abnormalities in Vitamin A, D, K, C & B Complex.
   - Biosynthesis, Storage, Mechanism of Release, Transport, Binding to Receptor, Mode of Activity, Biochemical Functions & Abnormalities in Insulin, Glucagon, Thyroid Hormones, Para thyroid Hormones, Calcitonin, Growth Hormone, Aldosterone, Corisol & Catacholamines.

Module 705 19

General Pathology

Duration 5 weeks

Credit hours (7)

Learning Objectives

- Describethe responses to different types of injury at the cellular and subcellular level
- Enlist the differences between necrosis and apoptosis.
- Describe different morphological patterns of tissue necrosis
- Describe the different types of responses of the cells to stress.
- Describe the different types of exogenous and endogenous pigmentations.
- Describe the sequence of vascular changes in acute inflammation (vasodilation, increased permeability) and their purpose.
- Define the terms edema, transudate, and exudate.
- Describe the steps involved in phagocytosis and the role of IgG and C3b as opsonins and receptors.
- Compare and contrast acute vs chronic inflammation with respect to causes, nature of the inflammatory response, and tissue changes10. Describe the differences between the various cell types (ie, labile, stable, and permanent cells) in terms of their regeneration potential. List examples of each cell type.
- Distinguish between fibrinous, purulent, and serous inflammation. Define an abscess.
- Describe the systemic manifestations of inflammation and their general physiology, including fever, leukocyte left shift, and acute phase reactants
- Define and understand the the process of excessive growth of different types of cell
- Differentiate the non neoplastic excessive ans neoplastic growths
- Understand the differences between benign and malignant tumors
- Understand the classification of different tumors
- Understand the TNM classification of malignant tumors
- Define and describe hyperemia and congestion ,edema, ,hemorrhage, thrombosis, infarction and embolism ,
- Describe shock. And its different types .Understand the mechanisms leading to shock.
- Describe the organization of nuclear material, its replication and division.
- Understand different modes of inheritance
- Describe the the different types of genetic aberrations
- Understand the basis of molecular diagnosis of genetic disorders
- Define the components of the immune system
- Understand the innate and adaptive immunity, the classes of immunoglobulins
- Define humoral and cellular immunity.
- Define the differences between immunity and hypersensitivity
- Describe the autoimmune diseases and their diagnosis
- Understand the immune deficiency states

Course contents

1:Cellular Basis of disease

Cellular responses to stress ;Adaptations of growth and differentiation, Cell injury and cell death

Hyperplasia
- Hpertrophy
- Atrophy
- Metaplasia
- Causes of Cell injury
- Mechanisms of cell injury
- Reversible and irreversible cell injury
- Morphology of cell injury and necrosis
- Apoptosis
- Sub cellular responses to injury
- Intracellular accumulations
- Pathological calcification

2:Inflammation and healing

- Acute Inflammation
  - Chemical mediators of inflammation
  - Outcomes of acute inflammation
  - Morphologic patterns of acute inflammation
  - Systemic effects of inflammation
  - Mechanisms of tissue regeneration
  - Repair by healing ,scar formation and fibrosis

3:Hemodynamic disturbances,

- Edema
- Hyperemia and congestion
- Hemorrhage
- Hemostasis and thrombosis
- Embolism
- Infarction
- Shock

4:Neoplasia

Biology of tumor growth

- Benign and Malignant Neoplasms
- Molecular basis of cancer
- Host defenses against tumors
- Clinical features of tumors

5:Genetic Disorders

- Mutations
- Mendelian disorders
- Disorders with multifactorial inheritance
- Cytogenetic disorders
- Single Gene disorders
- Molecular diagnosis
- Diagnosis of Genetic diseases

6:Diseases of immunity

- General features of immune system
- Cells and tissues of the immune system
- Innate and adaptive immunity
- Disorders of the immune system
- Autoimmune diseases
- Immunological deficiency syndromes

SEMINARS

- Cellular adaptations
- Haemodynaimcs
- Acute and chronic granulomatous inflammatory diseases
- Neoplasia
- Amyloidosis

PRACTICALS

- Acute inflammation : Granulation tissue
  Acute Appendicitis
- Chronic non specific inflammation: Chronic cholecystitis
  Chronic pyelonephritis
- Chronic granulomatous inflammation
- Actinomycosis
- Gangrene
- Hyperplasia: Benign prostatic hyperplasia

: Grave's disease

2.2

- Metaplasia
- Calcification
- Pigmentation
- Benign tumours: Fibroadenoma
  Leiomyoma
  Squamous cell papilloma
  Lipoma
  Haemangioma
- Malignant Tumours: Squamous cell carcinoma
  Basal cell carcinoma
  Adenocarcinoma

RECOMMENDED BOOKS

- Robbins and Cotran
  Pathologic BASIS OF DISEASES by Kumar Abbas Fausto 7th ed. 2004
- Ackerman's surgical Pathology by Juan Rosai 9th Ed. 2004
- Surgical Pathology by Sternburg 4th Ed.2004
- Cytology by Koss Ed. 2004
- Histological Techniques by Bencroft Ed.2004

MODULE 706
GASTROINTESTINAL TRACT
DURATION 3 WEEKS
CREDIT HOURS (5)

LEARNING OBJECTIVES

- Describe predisposing factors,pathology and prognosis of carcinoma of the oral cavity:
- Describe the classification and pathogenesis of esophagitis:
- Describe causes pathology and complications of Barrett esophagus:
- Compare and contrast squamous cell carcinoma and adenocarcinoma of the esophagus .
- Describe pathogenesis , pathology and complications of chronic gastritis.
- Classify the neoplasms of the stomach,its pathology , histological subtypes , metastases and prognosis.
- Enlist sequence of events leading to development of MALToma.
- Compare and contrast Crohn disease and ulcerative colitis with respect to:
    - clinical features and extraintestinal manifestations
    - pathogenesis
    - pathology (gross and microscopic features)
    - complications (especially adenocarcinoma preceded by dysplasia)

Classify intestinal tumours (small intestine and colon)

Define polyp,its types and polyp-cancer sequence

- Describe pathology , prognosis stages of Colon cancer:
- Classify tumours of appendix , their pathology and prognosis

COURSE CONTENTS

1. Inflammatory diseases and tumour of oesophagus
2. Gastritis and tumours of stomach
3. Malabsorption syndrome
4. Inflammatory bowel diseases
5. Tumours of small and large intestine
6. Appendicitis and tumours of appendix

RECOMMENDED BOOKS

- Robbins and Cotran
  Pathologic BASIS OF DISEASE by Kumar Abbas Fausto 7th ed. 2004
- Ackerman's
  Surgical Pathology by Juan Rosai 9th Ed. 2004
- Surgical Pathology by Sternburg 4th Ed.2004
- Cytology by Koss Ed. 2004
- Histological Techniques by Bencroft Ed.2004

MODULE 707
LIVER, BILIARY TRACT AND PANCREAS
DURATION 2 WEEKS
CREDIT HOURS (3)

LEARNING OBJECTIVES

- Describe the relative frequency, epidemiology, route of transmission, incubation period, and tendency to form a carrier/chronic state of infection with HAV , HBV , HCV and HDV
- Discuss the use of serological tests in differentiating between the various forms of viral hepatitis and in determining the state of the disease (ie, asymptomatic and symptomatic acute hepatitis and carrier and chronic states of infection).
- Describe the pathology of acute hepatitis, subfulminant and fulminant hepatitis, and chronic hepatitis.
- List multiple causes, other than viral infections, of subfulminant and fulminant hepatic failure.
- Describe the pathology of cirrhosis due to chronic viral hepatitis, and recognize that the use of the term postnecrotic cirrhosis is clinically misleading.
- Classify the various categories of liver disease associated with drug and toxin exposures, and list some of the more important agents responsible for these.
- Describe the microscopic features , types , causes sign and symptoms of cirrhosis.
- Describe the epidemiology, pathogenesis, pathology, and clinical consequences of the benign and malignant liver tumors:
- Compare and contrast the etiologies and pathogenesis of metabolic liver diseases.
- Compare the various types of gallstones, how they are formed, what the risk factors for their development are, and what complications they can cause.
- Describe the epidemiology, mechanisms of development, and clinical consequences of acute and chronic cholecystitis.
- Compare and contrast carcinomas of the gallbladder versus those elsewhere within the biliary tract.
- Describe the epidemiology, pathogenesis, morphology, and clinical findings of acute pancreatitis, including the major laboratory tests used in diagnosing the disease.
- Describe the pathology, pathogenesis, and clinical consequences of pancreatic adenocarcinoma.
- List the causes and clinical consequences of chronic pancreatitis.
- Describe the pathology, clinical features, and complications of chronic pancreatitis, including pseudocyst formation

SEMINARS

- Gastritis and its association with peptic ulcers.
- Malabsorption syndrome.
- Crohn's disease and ulcerative colitis.
- Update on Maltoma.
- Staging and grading systems of intestinal tumors.
- Update on Colorectal carcinoma.

PRACTICALS

- Slide session on oesophageal and gastric lesions.
- Slide session on non neoplastic lesions of intestine.
- Slide session on tumours of small intestine.
- Slide session on tumour of large intestine

RECOMMENDED BOOKS

- Robbins and Cotran Pathologic BASIS OF DISEASE by Kumar Abbas Fausto 7th ed. 2004
- Ackerman's Surgical Pathology by Juan Rosai 9th Ed. 2004
- Surgical Pathology by Sternburg 4th Ed.2004
- Cytology by Koss Ed. 2004
- Histological Techniques by Bencroft Ed.2004

Year 1 Semester 2

Class Schedule

Module No	708	709	710	1 week	711	712	713
Duration	3 weeks	3 weeks	3 weeks		3 weeks	3 weeks	3 weeks
Title of Module	Blood Vessels, Heart & Respiratory system	Kidney , Urinary Tract & Male Genital Tract	Female Genital Tract & Breast	Midterm Evaluation	Bones & Joints, Soft Tissue, Muscle & Skin	CNS & Endocrine	Lymph node, Thymus & Salivary Glands
Module Coordinator	Dr. Ihtesham	Dr. Ihtesham	Dr.Ihtesham		Dr.Ihtesham	Dr.Ihtesham	Dr.Ihtesha
Place of Learning	Department Lecture Room	Patiala Block	Patiala Block		Department Lecture Room	Department Lecture Room	Departmer Lecture Room

COURSE CONTENTS

2ND SEMESTER

MODULE 708
BLOOD VESSELS
HEART & RESPIRATORY SYSTEM
DURATION 3 WEEKS
CREDIT HOURS (5)

LEARNING OBJECTIVES

- Describe the natural history of atherosclerosis, its risk factors, morphological picture and complications.
- Compare and contrast atherosclerosis, Monkeberg medial calcific sclerosis, and arteriolosclerosis.
- Define ischemia, and angina with their associated morphology.
- Define acute myocardial infarction. List the sequential effects of ischemia,its histopathological changes.
- Compare and contrast transmural vs subendocardial infarction.
- Compare and contrast tests of CK and troponin with regard to timing, sensitivity, and specificity in acute myocardial infarction (AMI). Describe how sequential tests for CK-MB are used in the clinical setting to rule out AMI. Understand when CK-MB is unreliable in ruling out AMI. Describe the major tissue sources of the three CK isoenzymes (CK-MM, CK-MB, and CK-BB).
- Describe the specificity and time course of troponin as it relates to the diagnosis of acute myocardial infarction.
- List important complications of acute myocardial infarction. Know when the patient is at greatest risk for myocardial rupture

- Define cardiomyopathy. List its causes .
- Compare and contrast various types of cardiomyopathy
- Define myocarditis. Describe the histologic criteria for myocarditis. List some important etiologies for myocarditis.
- Define pericardial effusion, and list the clinically important types of pericardial effusions.
- Define pericarditis. List some infectious and noninfectious causes of pericarditis. List two causes of fatal hemopericarditis and tamponade
- Contrast obstructive vs restrictive lung disease.
- Define Emphysema, its types, gross and microscopic features .
- Define Bronchitis, pathogenesis and its morphological changes
- Describe the pathogenesis of diffuse interstitial lung disease and its causes .

Define sarcoidosis, organs involved , gross and histological appearance and its clinical course.

- Describe the relationship between lung cancer and cigarette smoking and other environmental hazards (including radon, etc.).
- Describe the histologic forms of lung cancer and their biologic behavior patterns.
- Describe the common location, typical histology, clinical manifestations, and cell of origin of bronchial carcinoid.
- List the important causes of serous and inflammatory effusions in the pleural space.
- Describe the major primary tumor of the pleura.
- Describe salient clinical and morphologic features of:
  - nasopharyngeal angiofibroma
  - undifferentiated nasopharyngeal carcinoma (so-called lymphoepithelioma)
  - vocal cord polyps
  - laryngeal squamous papilloma
  - laryngeal squamous carcinoma.

COURSE CONTENTS

1. Atherosclerosis
2. Vasculitis and aneurysms
3. Tumour of blood vessels
4. Ischemic heart diseases
5. Cardiomyopathies
6. Pericardial diseases
7. Tumours of heart
8. Lesions of nose and nasophyarynx
9. Laryngeal pathology
10. Obstructive pulmonary diseases
11. Interstitium lung diseases
12. Pulmonary infections
13. Lung tumours
14. Pleural diseases

SEMINARS

- Lab diagnosis of myocardial infarction.
- Risk factors / complications of Atherosclerosis.
- Slide Seminar on tumours of blood vessels.
- Latest update on interstitial lung diseases.
- Slide Seminar on tumours of lungs.

PRACTICALS

- Slide session on inflammatory diseases of blood vessels and heart.
- Slide session on inflammatory diseases of lung.

- Slide session on tumours of lung.

RECOMMENDED BOOKS

- Robbins and Cotran Pathologic BASIS OF DISEASE by Kumar Abbas Fausto 7th ed. 2004
- Ackerman's Surgical Pathology by Juan Rosai 9th Ed. 2004
- Surgical Pathology by Sternburg 4th Ed.2004
- Cytology by Koss Ed. 2004
- Histological Techniques by Bencroft Ed.2004

MODULE 709

KIDNEY,URINARY TRACT
&
MALE GENITAL TRACT
DURATION 3 WEEKS
CREDIT HOURS (5)

LEARNING OBJECTIVES

- Describe the causes and clinicopathologic features of the nephrotic syndrome.
- Classify glomerulonephritis
- Describe the clinical features and morphology of acute poststereptococcal glomerulonephritis
- Enlist the causes of proteinuria in children.
- Describe the pathogenesis and morphology of *Membranous glomerulonephritis*
- Define membranous GN, and distinguish between primary and secondary forms.
- Describe the morphologic glomerular changes of MGN by LM, IF, and EM.
- Describe the clinicopathological and characteristic light microscopic features of RPGN
- Enlist the major causes of tubulointerstitial diseases
- Describe the urinary tract infection (UTI) and acute and chronic pyelonephritis
- Describe the gross and microscopic changes in acute PN, including necrotizing papillitis.
- List salient clinical features (symptoms) and urinary findings in acute PN.
- Describe the composition of the most common forms of renal stones, pathogenesis and its complications
- Enlist major causes of tubulointerstitial diseases and histological findings.
- Describe the types, pathogenesis, gross and microscopic appearance of various renal cell tumours.
- Describe urothelial tumors.
- List the most common pathogen causing epididymitis in men younger than 35 years of age and in men older than 35 years of age.
- Compare and contrast the morphologic and clinical features of the two major types of testicular germ cell tumors: seminoma and nonseminomatous germ cell tumors. Identify the most common testicular tumor in children.
- Describe how the serum markers human chorionic gonadotropin (HCG) and alpha-fetoprotein (AFP) are related to germ cell tumors of the testis
- Describe the pathogenesis and morphological features of benign prostatic hyperplasia.
- Classify prostatic tumours , pathogenesis and its grading and staging.
- Describe the serum markers (PSA) in relation to prostatic lesions.

COURSE CONTENTS

1. Cystic diseases of kidney
2. Diseases of glomeruli
3. Diseases of tubules and interstitium
4. Diseases of renal blood vessels
5. Tumours of kidney
6. Cystitis and urinary bladder tumours
7. Lesions of epididymis
8. Orchitis and tumours of testis
9. Lesions of prostate

SEMINARS

- Different modalities used in diagnosis of glomerular diseases.
- Slide Seminar on tumours of kidney.
- Update on urothelial tumours.
- Gleason's scoring system of prostatic carcinoma.
- Slide Seminar on testicular neoplasm.

PRACTICALS

- Slide session on glomerular and tubulointerstitial diseases.
- Slide session on tumours of kidney and urinary bladder.
- Slide session on tumours of prostate.
- Slide session on neoplastic and non neoplastic lesions of testis.

RECOMMENDED BOOKS

- Robbins and Cotran Pathologic BASIS OF DISEASE by Kumar Abbas Fausto 7th ed. 2004
- Ackerman's Surgical Pathology by Juan Rosai 9th Ed. 2004
- Surgical Pathology by Sternburg 4th Ed.2004
- Cytology by Koss Ed. 2004
- Histological Techniques by Bencroft Ed.2004

MODULE 710
FEMALE GENITAL TRACT AND BREAST
DURATION 3 WEEKS
CREDIT HOURS (5)

LEARNING OBJECTIVES

- Define the cervical transformation zone.
- Review the endometrial and ovarian changes that occur during the menstrual cycle.
- List three risk factors for the development of cervical carcinoma.
- Classify benign and malignant cervical tumors, their pathogenesis and prognosis.
- Define PID (pelvic inflammatory disease); describe its common presentation and sequelae.
- Describe the following genital infections as they affect the female genital tract:
    - syphilis
    - gonorrhea
    - chancroid
    - *Chlamydia*
    - *Trichomonas*
    - herpes
    - human papilloma virus
- Define adenomyosis.
- Describe the incidence, common locations, three major pathogenetic potential origins, and the clinical features of endometriosis.
- Define dysfunctional uterine bleeding (DUB), and describe the pathogenesis of anovulatory cycles.
- Explain various types of hyperplasia and relation with adenocarcinoma.
- Describe the risk factors, pathogenesis, clinical features, and spread of endometrial carcinoma.
- Describe the typical clinical presentation, possible sequelae, and microscopic features of uterine leiomyomas. Compare with leiomyosarcoma.
- Define malignant mixed Mullerian tumor and endometrial stromal tumor
- Describe the pathogenesis and clinical features of polycystic ovarian disease.
- List the classifications of ovarian tumors, compare and contrast their morphological features.
- Describe the morphological features of germ cell and sex cord – stromal tumours.
- Define Krukenberg tumor.
- Compare and contrast the following inflammatory diseases with regard to etiology, clinical features, and histopathology:
    - acute mastitis
    - duct ectasia
    - traumatic fat necrosis
- Define the following patterns of fibrocystic changes, and explain their clinical significance:

- nonproliferative fibrocystic changes
- proliferative fibrocystic changes
- ductal hyperplasia
- sclerosing adenosis.

- Compare and contrast the following tumors with regard to morphology and clinical features:
  - fibroadenoma
  - phyllodes tumor
  - intraductal papilloma.
- Describe the incidence ,pathogenesis and types of carcinoma of e breast.
- Compare and contrast the pathologic features, relative incidence, and prognosis of the following types of breast carcinoma:
  - high-grade ductal carcinoma in situ
  - low-grade ductal carcinoma in situ
  - lobular carcinoma in situ
  - infiltrating ductal carcinoma
  - infiltrating lobular carcinoma.
- Describe how stage and grade of tumor relates to the clinical course of breast cancer. List six clinical and/or pathologic features that predict poor survival in breast cancer. Know what molecular marker affects prognosis.
- List the lesions included in gestational trophoblastic disease and their relative malignant potential.
- Compare and contrast complete and incomplete hydatidiform moles with regard to:
  - histology
  - cytogenetics
  - clinical behavior
- Identify the most common precursor lesions of gestational trophoblastic disease. Explain how serum HCG is used to follow patients with choriocarcinoma

COURSE CONTENTS

1. Vulvar and vaginal pathology
2. Cervicitis and cervical neoplasms
3. Normal endometrial cycle
4. Inflammatory and neoplastic conditions of endometrium
5. Tumours of myometrium
6. Ovarian tumours and tumour like lesions
7. Trophoblastic diseases
8. Inflammation , tumours and tumour like conditions of breast

SEMINARS

- Cervical intraepithelium neoplasm and its screening program (Pap smear).
- Classification, grading and staging of endometrial tumour.
- Update on stromal tumours .
- Rationale for classification of ovarian neoplasm.
- Slide Seminar on trophoblastic diseases.

- Prognostic indicators breast carcinoma.
- Update on phylloides tumour.

PRACTICALS

Slide session on neoplastic and non neoplastic lesions of vulva, vagina and cervix.
Slide session on neoplastic and non neoplastic lesions of corpus uteri.
Slide session on neoplastic and non neoplastic lesions of ovaries.
Slide session on trophoblastic diseases.
Slide session on neoplastic and non neoplastic lesions of breast.

RECOMMENDED BOOKS

- Robbins and Cotran Pathologic BASIS OF DISEASE by Kumar Abbas Fausto 7th ed. 2004
- Ackerman's Surgical Pathology by Juan Rosai 9th Ed. 2004
- Surgical Pathology by Sternburg 4th Ed.2004
- Cytology by Koss Ed. 2004
- Histological Techniques by Bencroft Ed.2004

MODULE 711

BONES AND JOINTS
SOFT TISSUE, MUSCLE AND SKIN
DURATION 3 WEEKS
CREDIT HOURS (5)

LEARNING OBJECTIVES

- List of Pathogenic bacteria associated with pyogenic osteomyelitis.
- Define sequestrum and involucrum.
- Compare and contrast tuberculous (granulomatous) osteomyelitis to pyogenic osteomyelitis with respect to incidence, bones affected, and consequences.
- Compare and contrast osteosarcoma, chondrosarcoma, giant cell tumor, and Ewing sarcoma.
- Compare and contrast the following tumors with respect to age, common location, and morphology:
    - osteoma
    - osteoid osteoma
    - osteoblastoma
    - osteochondroma
    - chondroma
- Cancer metastatic to bone
    - Contrast the incidence of cancer metastatic to bone with that of primary cancer of bone.
    - List the tumors that commonly metastasize to bone.
    - Note which metastatic tumor is likely to produce a sclerotic response
- Osteoarthritis (degenerative joint disease)
    - Describe the primary articular defect in osteoarthritis.
    - Distinguish between primary and secondary osteoarthritis.
    - List the joints that are predominantly affected.
    - Compare and contrast the changes in joint fluid in degenerative joint disease, rheumatoid arthritis, and gout.
- Rheumatoid arthritis
    - Describe the following features:
        - commonly affected joints
        - HLA associations
        - morphologic changes in the synovium, including pannus formation
    - Describe the significance of rheumatoid factor in the diagnosis and pathogenesis of rheumatoid arthritis.
    - Compare and contrast clinical and histologic features of osteoarthritis and rheumatoid arthritis.
- Pyogenic (suppurative) arthritis
    - List the common pathogens and the clinical settings in which they cause disease.

- Know the regions of the bone that are commonly affected, and why.
- Describe the usual course of the lesion.
- Describe the histologic picture seen in acute and chronic disease.

- Gout and gouty arthritis
  - Describe the pathophysiology of an attack of acute gouty arthritis with emphasis on the mechanisms by which crystals induce inflammation.
  - Describe the morphology and histology of a tophus and the sites commonly involved.
  - Distinguish between primary and secondary gout.
- 2. Compare and contrast the major clinical and pathologic features of primary myopathy and denervation atrophy.
- 3. Describe the ways in which primary myopathic disorders can be classified.
- Explain the etiology, inheritance pattern, age of onset of symptoms, prognosis, and histopathology of Duchenne muscular dystrophy.
- Define a dysplastic nevus and describe its evolution in to malignant melanomas.
- Classify malignant melonomas , its risk factors ,histological pictures and prognosis.
- *Enlist various epithelial cyst.*
- Describe the different normal adnexal structures in the skin.
- Describe the pathogenesis and prognosis of squamous cell carcinoma of the skinList the predisposing factors for the development of a squamous cell carcinoma of the skin.
- Define a basal cell carcinoma in terms of frequency, pathogenesis, localization, and clinical outcome.
- List the different conditions that are included in eczematous dermatitis.
- Describe the clinical and morphological features of psoriasis.
- Describe the clinical ,morphological features and differential diagnosis of lichen planus.
- Describe "colloid" or Civatte bodies.
- Describe discoid lupus erythematosus as a form of LE
- *Pemphigus*
- *Compare and contrast the various bullous lesions of skin.*
- Define verrucae in terms of pathogenesis, localization, histology, and natural history.

COURSE CONTENTS

1. Osteomyelitis and tuomurs of bones
2. Arthritis
3. Tumours and tumour like lesions of joints
4. Pseudosarcomas
5. Soft tissue tumours
6. Myocitis and myopathies
7. Tumours of skin
8. Acute and chronic inflammatory dermatosis
9. Bullous diseases

SEMINARS

- Bone tumours.
- Grading and staging of giant cell tumouor.
- Tumour like lesions. (Pseudosarcomas)
- Update on soft tissue tumours.
- Muscle dystrophy and neurogenic atrophy.
- Diagnostic criteria of malignant melanoma.
- Seminar on adnexal tumour.
- Seminar on blistering skin diseases.

PRACTICALS

Slide session on neoplastic and non neoplastic bone lesions.
Slide session on soft tissue sarcomas and pseudosarcomas.
Slide session on non neoplastic skin lesions.
Slide session on neoplastic skin lesions.
Slide session on myopathies.

RECOMMENDED BOOKS

- Robbins and Cotran Pathologic BASIS OF DISEASE by Kumar Abbas Fausto 7th ed. 2004
- Ackerman's Surgical Pathology by Juan Rosai 9th Ed. 2004
- Surgical Pathology by Sternburg 4th Ed.2004
- Cytology by Koss Ed. 2004
- Histological Techniques by Bencroft Ed.2004

MODULE 712
CENTRAL NERVOUS SYSTEM & ENDOCRINES

DURATION 3 WEEKS
CREDITS HOURS (5)

LEARNING OBJECTIVES

- Distinguish histologic from biologic malignancy in primary brain neoplasms.
- Compare the incidence and distribution of meningiomas, gliomas, and metastases to the brain and meninges.
- List the differential diagnosis of a ring-enhancing mass.
- List the histologic features that are evaluated when grading an astrocytic neoplasm.
- Describe the morphology and prognosis of medulloblastoma.
- Classify brain tumours , compare and contrast its various forms.
- Describe the morphologic, molecular, and clinical features of pituitary adenomas, including:
    - gross and microscopic appearances of adenomas
    - manifestations related to mass effect
    - endocrine manifestations, especially those related to the production of:
        - growth hormone
        - ACTH
        - prolactin
- List the major causes of hyperthyroidism.
- Discuss the laboratory tests useful in the diagnosis of suspected hyperthyroidism.
- Describe clinical and pathologic findings and the pathogenesis of Graves disease as a prototype of hyperthyroidism.
- Describe clinical and pathologic findings and the pathogenesis of multinodular goiter.
- Compare and contrast the major gross, microscopic, and clinical features of the following thyroid neoplasms, including oncogene associations, multifocality, metastatic patterns, relative incidences, and relative prognoses:
    - follicular adenoma
    - papillary carcinoma
    - follicular carcinoma
    - medullary carcinoma
    - undifferentiated (anaplastic) carcinoma
- Describe clinical and pathologic findings and the pathogenesis of Hashimoto thyroiditis as a prototype of hypothyroidism
- Describe the complications of diabetes mellitus.
- Compare and contrast the morphological features of renal cortical adenoma and carcinoma.

COURSE CONTENTS

1. Meningitis
2. Tumours of CNS
3. Pituitary adenomas
4. Thyroiditis and thyroid hyperplasia
5. Goitre
6. Thyroid neoplasms
7. Lesions of parathyroid gland
8. Complications of diabetes mellitus
9. Adrenal cortical and medullary neoplasms

RECOMMENDED BOOKS

- Robbins and Cotran
  Pathologic BASIS OF DISEASE by Kumar Abbas Fausto 7th ed. 2004
- Ackerman's
  Surgical Pathology by Juan Rosai 9th Ed. 2004
- Surgical Pathology by Sternburg 4th Ed.2004
- Cytology by Koss Ed. 2004
- Histological Techniques by Bencroft Ed.2004

MODULE 713
LYMPH NODE , THYMUS
&
SALIVARY GLANDS

DURATION 3 WEEKS
CREDIT HOURS (5)

LEARNING OBJECTIVES

- Describe the four main categories of lymphoid neoplasia as described in the Revised European-American Classification of Lymphoid Neoplasms (REAL) and World Health Organization (WHO) classifications.
- Understand the differences between the REAL and WHO classifications and the Working Formulation.
- *Diffuse large B-cell lymphoma (DLBCL)*
    - Describe the typical clinical features of DLBCL.
    - Understand the natural history of DLBCL, the impact of therapy, and the correlation between disease stage and survival.
    - Understand the morphologic and genetic heterogeneity seen in this disease.
- *Burkitt lymphoma*
    - Describe the main demographic subtypes of Burkitt lymphoma, including differences in clinical presentation and association with Epstein-Barr virus.
    - Describe the genetic lesions associated with all forms of Burkitt lymphoma.
    - Describe the typical morphologic features of this tumor that allow it to be discriminated from other forms of aggressive B-cell neoplasia.
- Compare and contrast Hodgkin lymphoma (HL) and non-Hodgkin lymphomas (NHL) clinically
- *Describe the morphological features and natural history of Follicular lymphomas..*
- Describe the age of the patients, presenting clinical findings, including physical and hematologic data, and the natural history of this disorder.
- Describe the mode of spread, histologic and cytologic characteristics and complications of SLL.
- Describe the clinical presentations, histological , cytological and genetic characteristic of Mantle cell lymphomas.
- Compare and contrast the clinical behavior of mantle cell lymphoma with both aggressive B-cell lymphomas (such as diffuse large cell lymphoma) and indolent B-cell lymphomas (such as follicular lymphoma).
- Describe the various types of MALT lymphoma.

- Describe the typical histologic characteristics of MALT lymphoma.
- Describe the association of *H pylori* with gastric MALT lymphoma and the role of antimicrobial therapy.
- Describe the common clinical manifestations, histologic features and clinical course of MF.
- Understand the relationship/distinction between MF and Sezary syndrome.
- *Hodgkin lymphoma (HL)*
- Describe the histologic hallmark of HL.
- Describe the basis of the histologic classification of HL and how this relates to the natural history of HL.
- Compare the three major histologic subtypes of HL with respect to.
    - major morphologic features
    - approximate frequency
    - prognosis
- Classify salivary glands tumours .
- Compare and contrast the morphological patterns of various salivary gland neoplasms.
- Classify thymomas .

COURSE CONTENTS

1. Reactive hyperplasia of lymph node
2. Lymphadenitis
3. Non Hodgkin's lymphomas
4. Hodgkin's lymphomas
5. Tumours of thymus
6. Sialadenitis
7. Salivary gland tumour

SEMINARS

- WHO classification of lymphoid neoplasm.
- Update on thymoma.
- Seminar on salivary gland tumours.

PRACTICALS

- Slide session on Non Hodgkin's lymphoma.
- Slide session on Hodgkin's lymphoma.
- Slide session on non neoplastic lesions of lymph node.
- Slide session on lesions of mediastinum.
- Slide session on salivary gland lesions.

RECOMMENDED BOOKS

- Robbins and Cotran Pathologic BASIS OF DISEASE by Kumar Abbas Fausto 7th ed. 2004

- Ackerman's Surgical Pathology by Juan Rosai 9th Ed. 2004
- Surgical Pathology by Sternburg 4th Ed.2004
- Cytology by Koss Ed. 2004
- Histological Techniques by Bencroft Ed.2004