



King Edward Medical University

Lahore

Postgraduate Education
MPhil Program

in

Chemical Pathology

CONTENT OF THE COURSES

2007

Introduction

King Edward Medical University (KEMU) is committed to excellence in promoting biomedical education at all levels and has robust programs at both undergraduate and postgraduate levels. KEMU has the distinction of being the first institute in the country to offer an M.Phil program in Chemical Pathology. 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 Chemical Pathology, which is offered through Pathology department.

Chemical pathology
M. Phil Program Faculty

Assoc. Prof. Riaz Javed Raja
Director M. Phil Program
Chemical Pathology

Prof. Dr. Kamran Aziz
Faculty M. Phil Program
Chemical Pathology

Assistant Prof. Dr. Afsar Saeed
Faculty M. Phil Program
Chemical Pathology

Prologue

by

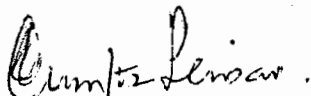
The Honorable Vice Chancellor KEMU

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 Diploma Coordination Committee, Professor Dr. - ----- and his 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 Surgery

King Edward Medical University & Mayo Hospital & University,

Lahore.

Prologue

by

The Chairman 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.

FOREWORD

(M.PHIL PROGRAMME IN CHEMICAL PATHOLOGY)

(2007)

(King Edward Medical University, Lahore)

The Rapid development of Chemical Pathology has been an outstanding feature of medical knowledge during the past twenty to thirty years. Knowledge of biochemical changes in diseases, and the means to estimate and skills to interpret the parameters evaluating these changes, are the domain of a chemical pathologist (a Clinical Biochemist).

The course of M. Phil Chemical Pathology is aimed at learning all the relevant biochemical and pathophysiological facts and theories necessary to the intelligent interpretation of data generated in a lab.

The main goal in designing this course was to combine the strength of existing knowledge on clinical and laboratory medicine concerning tests interpretation and general laboratory methods with a core curriculum focused on laboratory advancement in clinical chemistry and management of disease presented.

Riaz Javed Raja
M.Phil. (Chemical Pathology)
Associate Prof. & Director,
M. Phil. Programme,
Chemical Pathology.

Annexure IV

Quality Assurance

1. Academic Standard And Academic Quality

"Academic Standards" are predetermined and explicit levels of achievement that must be reached for a qualification to be awarded. "Academic Quality" the effectiveness of procedures and provisions that enable students to achieve qualification.

The Academic Standards therefore are incorporated into the followings:

1. Curriculum Design-Content-Organization.
2. Teaching-Learning-Assessment
3. Student progression and Achievement
4. Student Support and Guidance.
5. Learning Resources (State of Practice / Art)
6. Quality Management and Enhancement.

The measurement of effective of theses Academic Standards will determine the level of the "Academic Quality".

2. Quality Assurance Of The Program

The academic standards are developed as predetermined and explicit levels of achievements that must be reached by the students, different persons and bodies in the university must administrate the learning facilities and environment that must be arranged by the institution and the procedures efficiently and effectively.

The "Quality Assurance" is therefore carried out in three (03) cycles.

Cycle – 1: Monitoring; Continues monitoring by the faculty resulting in "Annual Monitoring Report". The report is generated by the Program Director. This is carried out every year.

Cycle – 2: Peer Review; or Internal Review, by a "Peer Review Committee" contributed by the King Edward Medical University comprising of three (03) teachers of the same specialty of the program, who are not members of the Program Faculty Committee these members may be preferably from outside the King Edward Medical University if available.

The cycle –2 is carried out every three (03) years.

Cycle – 3: "Accreditation; or External Review" The quality review is carried out by external reviews appointed by an Accreditation Body, board or Council. This cycle will be repeated every five (05) years, and King Edward Medical University makes all Accreditation reports available to the public.

3. Criteria For Peer Review Of The Academic Department With Reference To Academic Program

To review of the provisions of the program specification and the subject; the academic reviewers use a number of questions that have bearing on program specifications are stated below with a brief commentary.

Aims and Outcomes

I. Evaluation of intended learning outcomes in relation to external reference points and to the broad aims of provision. Reviewers should ask:

- What are the intended outcomes for a program?
- How do they relate to external reference points including subject benchmark statements, the qualifications framework and any professional body requirements?
- How do they relate to the overall aims of the provision as stated by the subject provider?
- Are they appropriate to the aims?

Commentary – Program specifications may be used to help explain the aims and outcomes of program show what reference points have been used in the construction of outcome statements and indicate how these outcomes relate to the national qualification frameworks and relevant subject benchmark statements.

II. Evaluation of the means by which the subject provider designs curricula that permit achievement of intended outcomes. Reviewers should ask:

- How does the provider ensure that curriculum content enables students to achieve the intended learning outcomes?
- How does the provider ensure that the design and organization of the curriculum is effective in promoting student learning and achievement of the intended learning outcomes?

Commentary – Reviewers will look for evidence of the planning and deliberative process through which program outcomes were determined and the curriculum designed to enable outcomes to be achieved. They will also look for evidence of how teaching teams evaluate whether the curriculum is effective in promoting learning and achievement against intended outcomes.

III. Evaluation of the means by which intended outcomes are communicated to students, staff and external examiners. Reviewers should ask:

- How are the intended outcomes for a program and its constituent parts communicated to staff, students and external examiners?
- Do the students know what is expected of them?

Commentary – Reviewers will consider the information available to staff and provided to students and external examiners. They might consider how program specifications are used to promote understanding about the program outcomes and the other strategies used to communicate information of this type.

Curricula

IV. Evaluation of the means by which the subject provider creates the conditions for achievement of the intended learning outcomes. Reviewers should ask:

- Do the design and content of the curricula encourage achievement of the intended learning outcomes in terms of knowledge and understanding, cognitive skills, subject-specific skills (including practical / professional skills), transferable skills, progression to employment and/or further study, and personal development?
- Is there evidence that the curricular content and design is informed by recent developments in techniques of teaching and learning, by current research and scholarship, and by any changes in relevant occupational and professional requirements?

Commentary – Reviewers will look for evidence that the curriculum supports the progressive development of intended outcomes. Program specifications can be used to show how the curriculum promotes the development of particular outcomes at each level. They may feature new or innovative pedagogic practice, or indicate which curriculum units have been particularly influenced by staff research.

Assessment

V Evaluation of the assessment process and the standard it demonstrates. Reviewers should ask:

- Does the assessment process enable learners to demonstrate achievement of the intended outcomes?
- Are there criteria that enable internal and external examiners to distinguish between different categories of achievement?
- Can there be full confidence in the security and integrity of assessment procedures?
- Does the assessment strategy have an adequate formative function in developing student abilities?

Commentary – the program specification provides a starting point for demonstrating how the assessment process enables the program outcome to be demonstrated.

Peer Review of the “Academic Programs” at KEMU.

The “Peer Review Committee” will be appointed by the Vice Chancellor to review the concerned academic department with relation to the Program every three (3) years. The Peer Review Committee will comprise of Three (3) experts in the same subject. These experts will be the teachers who are not members of the “Program Faculty Committee” of the same program. However it will be preferred to appoint members from out side KEMU. The “Peer Review Committee” will examine the yearly “Monitoring Reports” produced by the program directors, inspect the learning facilities and the conduction of the programs and interview the students and the teaching faculty (especially the young).

Criteria to review and report the program will be based on following six essential elements.

1. Curriculum Design-Content-Organization.
2. Teaching-Learning-Assessment
3. Student progression and Achievement
4. Student Support and Guidance.
5. Learning Resources (State of Practice / Art)
6. Quality Management and Enhancement.

All elements will evaluate out of 100 points and rated against 4 points as under.

1 (1 – 25)	2 (26 – 50)	3 (51 – 75)	4 (76 – 100)
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The final report of “Peer Committee” will be according to Quality Assurance criteria $6 \times 4 = 24$ points.

1. ACCREDITATION RULES OF PROCEDURE

These will be adopted from Liaison Committee on Medical Education, USA August 2005 edition [updated February 2006 and June 2006]

5. FACULTY SATISFACTION LEVEL

As required by Higher Education Commission, The Program Director will assess the faculty satisfaction level regarding the Postgraduate Diploma Program according to following criteria.

A: Excellent B: Very good C: Good D: Fair E: Poor

Sr.No	DESCRIPTION	A	B	C	D	E
1	Cooperation you received from colleagues	A	B	C	D	E
2	Cooperation you received from program director	A	B	C	D	E
3	Cooperation you received from Program Examination Committee.	A	B	C	D	E
4	The monitoring you performed & student response.	A	B	C	D	E
5	Remunerations/compensation for the Program.	A	B	C	D	E
6	Your satisfaction on the overall curriculum.	A	B	C	D	E
7	Your satisfaction on the overall learning resources.	A	B	C	D	E
8	Overall academic environment of the department.	A	B	C	D	E
9	Efforts to meet the time limits.	A	B	C	D	E

10. Your recommendation to improve the Program.

Name of the Teacher: _____

Activity involved in module nos: _____

Designation: _____

Address: _____

Date: _____ Signature: _____

6. STUDENT SATISFACTION LEVEL

As required by Higher Education Commission, the Program Director will assess the Student Satisfaction level regarding the concerned diploma program according to following criteria. The survey will be conducted after end of semester – 2.

A: Excellent B: Very good C: Good D: Fair E: Poor

Sr No	DESCRIPTION	A	B	C	D	E
1	The work in the program is too heavy and induces a lot of pressure.	A	B	C	D	E
2	The program is effective in enhancing team-working abilities.	A	B	C	D	E
3	The program administration is effective in supporting learning.	A	B	C	D	E
4	The program is effective in developing analytic and problem solving skills.	A	B	C	D	E
5	The program is effective in developing independent thinking.	A	B	C	D	E
6	The program is effective in developing written communication skills.	A	B	C	D	E
7	The program is effective in developing planning abilities.	A	B	C	D	E
8	The content of the program is adequate for pursuing the advanced courses in the program.	A	B	C	D	E
9	The training experience is effective in enhancing.	A	B	C	D	E
	Ability to work in teams independent thinking	A	B	C	D	E
	Appreciation of ethical values.	A	B	C	D	E
	Professional development	A	B	C	D	E
	Time management skills judgment	A	B	C	D	E
	Discipline	A	B	C	D	E
	The link between theory and practice.	A	B	C	D	E

10. Your recommendation to improve the program.

Student Name: _____

Date: _____ Signature: _____

7. ALUMNI SATISFACTION LEVEL

As recommended by Higher Education Commission the purpose of this survey is to obtain alumni input on the quality of education and the level of preparation they had at King Edward Medical University. The Program Director will conduct this survey and throughout the year and carry out analysis of the opinion received at the end of the year and include in the Annual Monitoring Report.

A: Excellent B: Very good C: Good D: Fair E: Poor

Sr. No	DESCRIPTION	A	B	C	D	E
1	Problem formulation and solving skills.	A	B	C	D	E
2	Collecting and analyzing appropriate data.	A	B	C	D	E
3	Ability to link theory.	A	B	C	D	E
4	Computer knowledge.	A	B	C	D	E
5	Oral Communication.	A	B	C	D	E
6	Report writing.	A	B	C	D	E
7	Ability to work in teams.	A	B	C	D	E
8	Independent thinking.	A	B	C	D	E
9	Appreciation of ethical values.	A	B	C	D	E
10	Professional development.	A	B	C	D	E
11	Time management skills	A	B	C	D	E
12	Discipline	A	B	C	D	E

Your Recommendation to improve the Program

Alumni Name: _____ Date: _____

Designation / Position: _____

Address: _____

E-mail: _____ Tel / Fax: _____

Annexure V

Relevant Web Sites

Higher Education Commission Pakistan:

www.hec.gov.pk

Quality Assurance Agency for Higher Education-UK:

www.qaa.ac.uk

Higher Education in Europe;

http://ec.europa.eu/education/policies/educ/higher/higher_en.html

ECTS - European Credit Transfer and Accumulation System:

http://ec.europa.eu/education/programmes/socrates/ects/index_en.html

Program Outline

Duration of the Program: 02 Years (Full Time)

Entry Qualifications: MBBS/BDS/BS.c Hons/MS.c
(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:

Entry

Year 1	Semester 1 (18 weeks)	Semester 2 (18 weeks)
	Semester Evaluation (02 weeks)	Semester Evaluation (02 weeks)
Comprehensive Evaluation (02 weeks)		
Year 2	Research & Dissertation (Lab. Work) 48 weeks	
	Project Synopsis Writing (4 weeks)	
	Research Project (42 weeks)	
	Dissertation Defense (02 weeks)	

Exit

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

Contact Hours 1500 – 1800 hrs/year

25 – 30 Contact Hours = 1 Credit Point

Number of Credit Point Required in a Year = 60

Number of Credit Point Required in a Semester = 30

Approach to PDP	Year-I	Year-II
1. Supporting the development and recognition of skills through the personal tutor system.		
2. Supporting the development and recognition of skills in academic modules / units.		
3. Supporting the development and recognition of skills through purpose designed – modules/units		
4. Supporting the development and recognition of skills through research projects and dissertations work.		
5. Supporting the development and recognition of career management skills.		
6. Supporting the development and recognition of career management skills through work placement or work experience.		
7. Supporting the development of skills by recognizing that they can be developed through extra curricula activities.		
8. Supporting the development of the skills and attitudes as basis for continuing professional development.		
9. Other approaches to personal development planning.		
10. The means by which self-reflection, evaluation and planned development is supported e.g. learning log book or diary.		

4.3 LOG BOOK

- 1. General Information**
 - 1.1 Particulars of the candidate
 - 1.2 Objectives of the logbook
 - 1.3 Instructions to the students
 - 1.4 Guidelines for the project director
 - 1.5 Aims and objectives of the training program
 - 1.6 Guidelines for the competency levels
 - 1.7 Guidelines for filling consolidated sheets
 - 1.8 List of different types of procedures
 - 1.9 Weekly program
- 2. Skills Record**
 - 2.3 General Skills
 - 2.4 Procedures
 - 2.5 Case Presentation
 - 2.6 Journal Clubs
 - 2.8 Consolidated sheet

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:

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	Major Subject	40%
	Total Questions & Marks	200
	Pass Marks	50%

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.

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

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Year 1 Semester 1

Class Schedule

Module N.o							
	701	702	703	704	1 week	705	706
Duration	2 weeks	2 weeks	2 weeks	2 weeks			5 weeks
Title of Module	Introduction to Chemical Pathology	Research Methods & Biostatistics	Molecular Biology & Genetics	Basic Science	Midterm Evaluation	General Pathology	Instrumentation in Chemical Pathology
Module Coordinator	Asso. Prof. Riaz Javed Raja	Prof. Syed Muhammad Awais	Prof. Fridoon	-----		Prof. Muhammad Munir	Asso. Prof. Riaz Javed Raja
Place of Learning	Department Lecture Room	Patiala Block	Patiala Block	Department Lecture Room		Department Lecture Room	Department Lecture Room

Year 1 Semester 1

Class Schedule

Module N.o

	701	702	703	704	1 week	705	706
Duration	2 weeks	2 weeks	2 weeks	2 weeks		Midterm Evaluation	5 weeks
Title of Module	Introduction to Chemical Pathology	Research Methods & Biostatistics	Molecular Biology & Genetics	Basic Science	General Pathology		Instrumentation in Chemical Pathology
Module Coordinator	Asso. Prof. Riaz Javed Raja	Prof. Syed Muhammad Awais	Prof. Fridoon	-----	Prof. Muhammad Munir		Asso. Prof. Riaz Javed Raja
Place of Learning	Department Lecture Room	Patiala Block	Patiala Block	Department Lecture Room	Department Lecture Room		Department Lecture Room

Course Content

Semester I (M.Phil Chemical Pathology) (20 WEEKS)

MODULE 701

Introduction to Chemical Pathology

(DURATION 2 WEEKS)

Course Description and Learning Objectives:

Students are given induction to the laboratory at the beginning of training. The objective is to get them familiar with laboratory working, including sampling, and basic knowledge of quality assurance in clinical chemistry lab.

Course Contents:

1. ✓ Historical background
2. ✓ Knowledge of specimen collection, handling, transport and sample storage.
3. ✓ Understanding the use of specific preservatives and possible interference in assays.
4. Knowledge of laboratory hazards, health and safety problems.
5. ✓ Use of SI units
6. Reference values
7. Basic concepts of quality assurance

Practicals/Demonstrations:

1. Specimen collection
2. Centrifugation
3. Specimen Processing and Storage

Book Recommended:

1. Textbook of Clinical Chemistry. By Burtis, Ashwood, Tietz. W.B. Saunders.
2. Clinical Chemistry: Theory, Analysis, Correlation. By Kaplan, Pesce and Kazmierczak. Mosby.
3. Varley's Practical Clinical Biochemistry
Heinemann Professional Publishing.

Molecular Cell Biology

(DURATION 2 WEEKS)

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 discipline.
- 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

Seminar Topics:

- Genes and Development
- Recombinant Biotechnology
- Molecular and Genomic Evolution
- Molecular Evolution
- Molecular Immunology

Book Recommended:

1. Life, 'The Science of Biology' by Craig Heller

Course Description and Learning Objectives:

- Understand the responses to different types of injury at the cellular and sub-cellular level
- Describe the difference between necrosis and apoptosis.
- Understand 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 (vasodilatation, 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 changes. 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 process of excessive growth of different types of cell
- Differentiate the non neoplastic excessive and 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 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

Hyperplasia

Hypertrophy

Atrophy

Metaplasia

Cell injury and cell death

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:

1. Cellular adaptations
2. Haemodynamics
3. Acute and chronic granulomatous inflammatory diseases
4. Neoplasia
5. Amyloidosis

Practicals:

1. Acute inflammation : Granulation tissue
Acute Appendicitis
2. Chronic non specific inflammation: Chronic cholecystitis
Chronic pyelonephritis
3. Chronic granulomatous inflammation
4. Actinomycosis
5. Gangrene
6. Hyperplasia: Benign prostatic hyperplasia
7. Grave's disease
8. Metaplasia
9. Calcification
10. Pigmentation
11. Benign tumours: Fibroadenoma
12. Leiomyoma
13. Squamous cell papilloma
14. Lipoma
15. Haemangioma
16. Malignant Tumours: Squamous cell carcinoma
17. Basal cell carcinoma
18. Adenocarcinoma

Recommended Books

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

Instrumentation in Chemical Pathology

(DURATION 5 WEEKS)

Course Description and Learning Objectives:

To become a competent analyst with appreciation of a range of analytical techniques, their performance, comparative usefulness and applications so as to be competent in the management of the chemical pathology laboratory.

Course Contents:

- ✓ 1. Spectrometric methods
 - ✓ Spectrophotometers
 - Atomic Absorption
 - Nephelometry
 - Fluorometers
 - Turbidimetry
- ✓ 2. Automated instrumentation
3. Electrometric methods
 - pH-Meters
 - Ion-Selective Electrodes
 - Blood-Gas analyser
- 4. Immunochemical techniques
 - ELISA
 - RIA
- ✓ 5. Electrophoresis
- ✓ 6. Chromatography

Practicals/Demonstrations:

1. Use of photometers
2. Use of Flame photometer
3. Operation of Automated Analyzers
4. ELISA
5. Electrophoresis
6. Quality control of Equipments

Book Recommended:

1. Textbook of Clinical Chemistry. By Burtis, Ashwood, Tietz. W.B. Saunders.
2. Clinical Chemistry: Theory, Analysis, Correlation. By Kaplan, Pesce and Kazmierczak. Mosby.
3. Varley's Practical Clinical Biochemistry
Heinemann Professional Publishing.

Year 1 Semester 2

Class Schedule

Module N.o							
	707	708	709	1 week	710	711	712
Duration	2 weeks	2 weeks	4 weeks	Midterm Evaluation	4 weeks	3 weeks	2 weeks
Title of Module	Laboratory Management	Quality Control & Quality Assurance	Chemical Pathology I		Chemical Pathology II	Endocrinology	Clinical Enzymology
Module Coordinator	Dr. Afsar Saeed	Asso.Prof. Riaz Javed Raja	Asso.Prof. Riaz Javed Raja		Asso.Prof. Riaz Javed Raja	Dr. Afsar Saeed	Asso.Prof. Riaz Javed Raja
Place of Learning	Department Lecture Room	Patiala Block	Patiala Block		Department Lecture Room	Department Lecture Room	Department Lecture Room

Course Content

Semester II (M.Phil Chemical Pathology)

MODULE 707

Laboratory Management

(DURATION 2 WEEKS)

Course Description and Learning Objectives:

To develop skills to take independent responsibility for the direction and management of the service.

Course Contents:

1. Introduction to laboratory management
2. Budget and cost accounting
3. Human resources management
4. Selection of analytical equipment
5. Development of lab. instrument platform
6. Acute care and STAT laboratory testing
7. Laboratory accreditation programme
8. Overview of laboratory information system (LIS)

Practicals/Seminars:

Comparison of methodologies (regression analysis)

Demonstration of LIS

Book Recommended:

1. Laboratory Management and Clinical Correlation
By Kent Lewandrowski. Lippincott Williams Wilkins.
2. Textbook of Clinical Chemistry. By Burtis, Ashwood, Tietz. W.B. Saunders.
3. Clinical Chemistry: Theory, Analysis, Correlation. By Kaplan, Pesce and Kazmierczak. Mosby.

MODULE 708

Quality Control and Quality Assurance

(DURATION 2 WEEKS)

Course Description and Learning Objectives:

Students will learn to understand terminology, implementation, interpretation and effective utilization of quality control data.

Course Contents:

1. Quality Control vs Quality assurance
2. Purpose of Quality assurance program
3. Internal Quality Control Practices
4. Errors effecting lab Results
5. External quality Control Programmes

Practical/Demonstration:

1. Demonstration of Precision
2. Standard Deviation and Levy Jennings Charts
3. Accuracy Experiments
4. Linearity Experiments

Books Recommended:

1. Textbook of Clinical Chemistry. By burtis, Ashwood, Tietz. W.B. Saunders.
2. Clinical Chemistry: Theory, Analysis, Correlation. By Kaplan, Pesce and Kazmierczak. Mosby.
3. Varley's Practical Clinical Biochemistry
Heinemann Professional Publishing.

Chemical Pathology I

(DURATION 4 WEEKS)

Course Description and Learning Objectives:

To correlate knowledge of normal human biochemistry and physiology to the chemical pathology in screening, diagnosis and monitoring of diseases.

Course Contents:

1. **Acid-Base and Electrolytes Disorders**
 - Regulation of Body Water
 - Regulation of Acid-Base Balance
 - Sodium Metabolism and Osmolality
 - Potassium Metabolism
 - Blood Gases and Blood Gas Analyzers
2. **Kidneys and Urinary Tract Diseases**
 - Urea (Amino Acid metabolism)
 - Serum Creatinine and Creatinine Clearance
 - Serum Uric Acid
 - Acute Renal failure
 - Chronic Renal Failure
 - Renal Stones
3. **Disturbances of Calcium , Phosphate and Magnesium metabolism**
 - Calcium and Phosphorous Metabolism
 - Hyper and Hypocalcaemia
 - Hyper and Hypophosphatemia
 - Disorder of Parathyroid Glands
4. **Protein: Structure , Metabolism and Disorders**
 - Classification of Plasma Proteins
 - Total Protein
 - Acute Phase Reactants

- Individual Proteins in Diseases
- Serum Protein Electrophoresis
- Immunoglobulins and Immunodeficiency Syndromes

Practical/Demonstration:

1. Estimation of Serum Calcium
2. Estimation of Serum Creatinine
3. Estimation of Serum Uric Acid
4. Estimation of serum Urea
5. Estimation of Serum Total Proteins
6. Estimation of Serum Albumin
7. Estimation of Immunoglobulins

Books Recommended:

1. Textbook of Clinical Chemistry. By burtis, Ashwood, Tietz. W.B. Saunders.
2. Clinical Chemistry: Theory, Analysis, Correlation. By Kaplan, Pesce and Kazmierczak. Mosby.
3. Varley's Practical Clinical Biochemistry
Heinemann Professional Publishing.
4. Clinical Physiology of Acid-Base and Electrolyte Disorders.
McGRAW – HILL .
5. Laboratory Management and Clinical Correlation
By Kent Lewandrowski
LIPPINCOTT WILLIAMS WILKINS

Mid-Semester Evaluation (1 WEEK)

1. Liver Diseases

- Bilirubin And Hyperbilirubinemia
- Bilirubin Estimation
- Liver Enzymology
- Tests of Hepatic Synthetic Capacity
- Liver failure and Cirrhosis

2. Disturbances of Lipid Metabolism

- Fatty Acids and Triglycerides
- Cholesterol and Cholesterol Esters
- Lipoproteins and their Measurements
- Clinical Significance of Lipids and Lipoproteins Testing
- Familial Hyperlipidemias

3. Inborn Errors of Metabolism

- Clinical Presentation of Metabolic Disorders
- Classification
- Laboratory Detection (Screening and Diagnostic)
- Amino-Acid Disorders
- Disorders of Carbohydrate Metabolism

Practical/Demonstration:

1. Screening for inborn errors.
1. Estimation of Serum Bilirubin
2. Estimation of Serum SGPT/SGOT
3. Estimation of Serum Cholesterol/Triglycerides
4. Estimation of Serum Protein/Albumin

Book Recommended:

1. Laboratory Management and Clinical Correlation

By Kent Lewandrowski. LIPPINCOTT WILLIAMS WILKINS

2. Cases in Chemical Pathology: A Diagnostic Approach. Whalmsley, Watkinson &

Koay. World Scientific Publishing.

3. Clinical Biochemistry: An Illustrated Colour Text. By Gaw, Cowan, Reilly.
Churchill Livingstone.

4. A guide to Diagnostic Clinical Chemistry. By Walmsley and White. Blackwell
Scientific.

Clinical Endocrinology

(DURATION 3 WEEKS)

5. Diabetes Mellitus and Other Carbohydrate Disorders

- Classification of Diabetes
- Glucose Assays
- Tests to Monitor Diabetes
- Hypoglycemia
- Other Carbohydrate Disorders

6. Other Disorders of the Endocrine System

- Thyroid Disorders (Hyperthyroidism and Hypothyroidism)
- Adrenals (Cushing Syndrome, Addison Disease and Hyperaldosteronism)
- Pituitary Disorders
- Reproductive Endocrinology

Practical/Demonstration:

1. Estimation of Serum Glucose
2. Estimation of HbA_{1c}
3. Estimation of Serum T₃, T₄ and TSH
4. Estimation of Free T₃ and T₄
5. Estimation of FSH, LH, Prolactin
6. Estimation of Estradiol
7. Estimation of Testosterone

Book Recommended:

1. Textbook of Clinical Chemistry. By Burtis, Ashwood, Tietz. W.B. Saunders.
2. Clinical Chemistry: Theory, Analysis, Correlation. By Kaplan, Pesce and Kazmierczak. Mosby.
3. Clinical Physiology of Acid-Base and Electrolyte Disorders. McGRAW – HILL .

Clinical Enzymology

(DURATION 2 WEEKS)

- Enzymes and Enzymatic Assays
- Factors Influencing Enzyme Assays
- Cardiac Enzymes
- Muscles Enzymes
- Liver Enzymes
- Pancreatic Enzymes

Practical/Demonstration:

1. Estimation of Serum CPK
2. Estimation of Serum LDH
3. Estimation of Serum CK-MB
4. Estimation of Serum Amylase
5. Estimation of Serum Aldolase

Books Recommended:

1. Textbook of Clinical Chemistry. By burtis, Ashwood, Tietz. W.B. Saunders.
2. Clinical Biochemistry: Matabolic and Clinical Aspects. Elsevier Science Health Science Div.

By Marshall

EHS Science Division

End-Semester Evaluation (1 WEEK)

Technical Standards/Requirement of M. Phil Program

To ensure graduate education of an excellent caliber M.Phil programs the following guidelines

1 Entitlement, Responsibilities & Eligibility

1.1 Student Entitlement to the Study and Research Amenities:

Students will be provided an environment that is conducive to their scholarly activities.

Students will be provided sufficient materials and supervision to ensure timely completion of their studies and research.

Students will be given access to the entire relevant faculty for guidance and advice.

Students will be entitled an access to computer and internet facilities to aid their studies and research.

1.2 Responsibilities/Eligibility of the M.Phil Supervisor:

- a) The supervisor will himself hold an M.Phil, an equivalent or a PhD degree and three years of research experience.
- b) Supervisor will ensure that his/her students are provided their entitled amenities.
- c) Supervisor will ensure that his/her students are provided sufficient materials and supervision to ensure timely completion of their studies and research.
- d) Supervisors will prepare a yearly progress report; the report will account the Educational Standards that were achieved and overall health of the M.Phil program listing any impediments and their possible solutions. This report will be submitted to the director M.Phil program.
- e) Consider a graduate student as a "junior colleague in research".
- f) Work with the student to establish the supervisory committee as soon as possible after the commencement of the program, and ensure that it maintains contact and formally meets with the student at least once a year.
- g) When going on leave or during an extended period of absence, ensure that the student is adequately supervised by the provision of an acting supervisor (who should be a member of the supervisory committee),
- h) Ensure that the student is aware of his/her guidelines (as listed below), and when necessary, assist the student in meeting them; and

1.3 Program of studies and progress report:

- a) The period of completion of M.Phil Program shall be counted from the date of registration.
- b) The minimum period of completion of M.Phil program shall be two years.
- c) Candidates from Scientific Research Organization after the completion of their course work may carry out their experimental work in their parent laboratory on the recommendation of the Supervisor and with the approval of the Board of Studies/Faculty Council, at the time of approval of the synopsis (for guidelines for preparation of synopsis see Annexure I).
- d) A M.Phil student shall be required to pass a comprehensive examination written/oral at the completion of first year.
- e) After passing the comprehensive examination, but before the submission of his thesis, M.Phil student will give one seminar on the topic relevant tot his field of Research.

Annual Program Report:

The supervisor/s of a M.Phil student shall submit a detailed report by 31st December each year on the progress of the student for the consideration of the advanced studies and Research Board.

2 Evaluations

- 2.1 Evaluations help to measure effectiveness of a learning program. It uses assessment and validation tools to provide data for the evaluation. Assessment is the measurement of the practical results of the training in the work environment; while validation determines if the objectives of the training goal were met.
- 2.2 The term "evaluation" refers to continuous assessment, tests and examinations conducted at the end of a module, clinical clerkship or a stage of the curriculum.
- 2.3 Evaluation is used as a tool for improvement in learning as well as for certification i.e. student's performance is reviewed with them as an aid for learning.
- 2.4 The faculty assesses understanding of concepts rather than memorization of facts, application of knowledge, competence in practical and clinical skills and appropriate professional behavior.
- 2.5 Evaluation of students conducted at the end of the modules and rotations, includes components from continuous evaluation during the modules. The purpose is to utilize continuous evaluation for assisting learning through early awareness of student's strengths and weaknesses of knowledge, skills and attitudes. Continuous assessment is also used for eligibility to sit in the Final Examination.
- 2.6 Any student identified as having academic difficulties should be assessed in depth by appropriate faculty.
- 2.7 Students should be evaluated by an External Examiner for all certifying examinations.

Scoring and Grading System

- 3.1 A grade in education means either a teacher's evaluation of student's work or a student's level of educational process. In other words we can say that the performance of a student in a given module is made through continuous valuation. Grades are allocated to a student according to his/her performance in a module.
- 3.2 Grade ranking is required to be reflective of the various examinational performances. It is the predictive character of grades, which determines the institutional reputation. Grading reflects the individual's standing in his group.
- 3.3 In M. Phil. Thesis, Research Projects, Dissertation and Reports will be evaluated by the under mentioned grading scales.

Percentage Marks	Description
80 and above	Distinction
60 – 79	Satisfactory
Below 60	Unsatisfactory

GPA System

Grade Point Value

The numerical value assigned to a grade letter is known as grade point value.

Percentage Marks.	Letter Grade	Grade Point Value	Description
90 and above	A+	4.0	Exceptional
85 – 89	A	3.70	Out Standing
80 – 84	B+	3.30	Very Good
75 – 79	B	3.00	Good
70 – 74	B-	2.70	Average
65 – 69	C+	2.30	Satisfactory
60 – 64	C	2.00	Pass
55 – 59	C-	1.70	Low Pass
50 – 54	D	1.00	Barely Passing
Below 50	F	0.00	Fail

- 4.1 Maximum possible Grade Point Average is 4.00.
- 4.2 Minimum Grade Point Average of obtaining M.Phil. Degree is 3.0.
- 4.3 A fraction of mark in a module is to be counted as '1' mark e.g. 64.1 or 64.9 is to shown as 65.

5 Progressions

- 5.1 All students are required to achieve at least 50% marks in each module and GPA 3.00 and have attended 80% of the delivered lectures and practical separately in each module at the end of semester-I for progression to the semester-II.
- 5.2 If a student fails to achieve 50% marks in any module assessment in any semester will be allowed **ONE** chance availed or un-availed to pass the failing module/s in Special Make-up Test/s.
- 5.3 If a student has obtained at least 50% marks in all modules but obtains GPA of 2.00 or more but less than 3.00 in any semester will be allowed to appear in Special Make-up test in Module/s with less than 3.0 Grade Point Value but more than or equal to 2.0 Grade Point Value for the improvement of GPA in **ONE** Chance availed or un-availed.

- 5.4 If a student who fails to secure GPA 2.00 at the end of any semester shall be automatically dropped from the rolls of the university.
- 5.5 All students are required to achieve at least 50% marks in each module and GPA 3.00 and have attended 80% of the delivered lectures and practical separately in each module at the end of semester-II.
- 5.6 A student who has passed semester-I and semester-II shall be eligible to Appear in Comprehensive Examination at the end of year one.
- 5.7 The scripts of Mid Semester Examination and Final Semester Examination of Semester-I and Semester-II shall be shown to the students by the teacher concerned however these scripts will be taken back after student has viewed them. The Department concerned shall keep such record for one year.
- 5.8 The teacher shall send the award list to the Chairman/Director/Principal of the Department to the Institute/Center/University who will forward it to the Controller of Examinations and a copy to Dean.
- 5.9 Any student, who is incapacitated because of illness, a suffering from severe affliction or has other compelling reasons, may apply for Special Make-up Test for the missed examinations of any module to the Head of the Department under intimation to the Controller of Examinations within five working days of the last date of missed examination with documentary proof.
- 5.10 In case of illness, he/she should submit medical certificate counter signed by the University Medical Officer.

6 Comprehensive Examination

- 6.1 Student admitted to the M.Phil. shall take Comprehensive Examination after the first academic year.
- 6.2 The Comprehensive Examination will cover course work of all modules of the program taught during the academic year. The Examination will test student's ability to integrate and assimilate the knowledge obtained from the course, seminars and independent studies.
- 6.3 Controller of Examinations shall appoint Examiners for the Comprehensive Examination on the recommendation of the "M.Phil. Program Coordination Committee".
- 6.4 A student who obtains at least 50% marks in each paper with GPA 3.00 will pass Comprehensive Examination.
- 6.5 A student who fails to achieve 50% marks in any paper will be given **ONE** Chance availed or un-availed to pass the failing paper/s in the Re-sit Examination on the recommendation of his/her supervisor and M.Phil. Program Coordination Committee.

- 6.6 A student who has obtained at least 50% marks in all papers but obtains GPA of 2.00 or more but less than 3.00 in Comprehensive Examination will be allowed to appear in the Re-sit Examination in paper/s with less than 3.0 Grade Point Value but more than or equal to 2.0 Grade Point Value for the improvement of GPA in **ONE** chance availed or un-availed on the recommendation of his/her supervisor and M.Phil. Program Coordination Committee.
- 6.7 The registration of an M.Phil student shall be deemed as cancelled if he/she does not pass the Comprehensive Examination even in the second attempt.
- 6.8 The syllabus for the Theory, Practical/Viva Voce Papers will be defined by the concerned department.

Papers of the Comprehensive Examination

Panel of Examiners; One Internal and one external in each program.

Theory Papers	Two (02)
Marks	100 Each Paper
Composition of Each Paper:	
MCQ	25%
Short Essay Questions	50%
Long Essay Questions	25%
Practical / Skills	100 Marks
Viva Voce Examination	100 Marks
Total Marks (Theory + Practical + Viva Voce Examination) =	
200 + 100 + 100 = 400	

6.8.2 Final Award

Log Book. (Record & Assignments);	10%
Internal Assessment (Semester Evaluations)	40%
Comprehensive Examination	50%
<hr/> Total	<hr/> 100%

The Final obtained marks will be translated into grades and Grade points.

Dissertation For M. Phil. Degree

- 7.1 Dissertation shall be a compulsory requirement for M.Phil. Degree.
 - 7.2 A candidate who qualifies the Comprehensive Examination may be allowed to prepare his/her research synopsis for M.Phil. Dissertation.
 - 7.3 The synopsis shall be presented by the candidate before the Faculty Council for approval within four weeks.
 - 7.4 A candidate will be given One Year for completion of his/her Dissertation after approval of the research synopsis for M. Phil Dissertation.
 - 7.5 The candidate shall work under the supervision of Supervisor/Guide appointed for this purpose by the concern department after the approval of Dissertation.
 - 7.6 An extension of one more year will be given in case of Non-Completion or rejection of M. Phil. Dissertation.
 - 7.7 The date for the submission of Dissertation shall be notified by the Faculty Council.
 - 7.8 The Board of Examiners for Viva Voce Examination shall comprise of the Head of the Department, Supervisor and External Examiner approved by the Faculty Council.
 - 7.9 The Board of Examiners shall evaluate the Dissertation in an oral examination of the candidate. A candidate should score at least 60% marks for the approval of the Dissertation.
 - 7.10 The Board may recommended a revision and one time re-submission of the Dissertation in case the Dissertation is not up to the standard and he/she fails to get 60% marks.
 - 7.11 The candidate should be informed in writing by the convener about the changes he/she has to carryout in the Dissertation under intimation to the Controller of Examinations.
 - 7.12 The candidate will resubmit the Dissertation after making the changes proposed by the Board of Examiners within Three months. The convener of the Board shall reconvene the meeting of the Board of Examiners to evaluate the resubmitted Dissertation in an oral examination of the candidate.
 - 7.13 In case the candidate does not carry out the suggested amendments or fails in oral examination after the second attempt, his/her candidature shall be cancelled.
 - 7.14 The candidate has to submit a new Dissertation after approval by the university authorities, if he/she desires and he/she will be considered new candidate for M.Phil. Dissertation.
 - 7.15 Dissertation must form a distinct contribution to knowledge and afford evidence of originality, shown by the exercise of independent critical judgment.
- Dissertation must not include research work for which degree has been conferred on him/her in this or any other university.
- 7.17 The candidate shall submit through his/her supervisor four copies (05 copies in case of co-supervisor) of his/her Dissertation typed or printed, along with 4 copies of a short abstract of about 1000 words. The candidate will also submit formatted copy of Dissertation on one CD for electronic library.

- 7.18 The Dissertation should be presented according to the format approved by the King Edward Medical University Lahore.
- 7.19 The Dissertation, which has been accepted, shall become property of the King Edward Medical University Lahore.
- 7.20 The candidate shall pay the prescribed fee for the examination at the time of submission of the Dissertation.

Annexure I

The thesis synopsis should be organized according to the following pattern.

a.	Title	
b.	Introduction	Should clearly manifest why the present work is undertaken.
c.	Literature Review	Place the project in academic context by referring to the major work by others on the topic.
d.	Objectives	Define clearly the aims of the research proposal.
e.	Significance	Explain the significance of the proposal for the field and the country.
f.	Plan	Give month wise tentative plan of the work.
g.	Methodology	Explain the approach and methods he/she will follow
h.	Bibliography	Up to date references.

Annexure II

The dissertation must be bound in accordance with the following specifications.

- a. Quarts approximately 10 inches, except for drawings and maps on which no restriction is placed. A margin of 105 inches to be left on left hand side. Cloth bound in standard size. Lettered boldly up back in gold (1 inch letters).
- b. The front should be the title, name of the candidate and the insignia of the University.

Annexure III

Terms & Definitions

Modules and Units (Small Packets):

Modularization of the Curriculum involves dividing the curriculum content (syllabus) into modules, which can be further divided into units. The module should consist of coherent and explicit learning activities. Modules can vary in length, but most institutions are moving towards standardization of length and credit value of the modules.

All programs based on Multiple Year Study Block, Annual Study Blocks and Semesters can be modularized. Thereby dividing the curriculum contents (syllabus) into small packets (modules) which can be further divided into units.

Thus, Modularization of curriculum is a way of organizing learning material in self-contained units that fit learner needs rather than the rigid boundaries of traditional courses. Each module is a self-contained learning unit based on the achievement of a specified set of learning outcomes.

In any modern educational institution, great flexibility is needed in terms of curricular design. The increasing trend towards modular systems and the running of courses, the scheduling system used must have sufficient flexibility to allow it to deal with a wide variety of structures.

In modularization the curriculum divided into more discrete units of assessable study can be easily replaced by new units / parts of improved quality. Modularization means that small parts can be put together to a whole because they come with standardized interfaces by which they can be connected.

Modules create greater access and flexibility to learning, to a variety of assessment tools, and to attainment of certification. They clearly define competencies / outcomes and assessment methods and expectations.

The focus on learning outcomes and the workload of students may help to increase the transparency as well as the efficiency of study programs.

Semester's academic units and modules are also support students for migration and re-entry.

CREDIT ACCOMOLATION AND TRANSFER SYSTEM (CATS) of KEMU

In a credit accumulation system learning outcomes totalling a specified number of credits must be achieved in order to successfully complete a semester, academic year or a full programme of study, according to the requirements of the programme. Credits are awarded and accumulated if the achievement of the required learning outcomes is proved by assessment.

Credit accumulation provides students with the opportunity to have their learning achievements (e.g. from work-based and experiential learning) count towards a qualification. Credit transfer works at various levels: regional; inter-university; internal (within institutions); inter-qualification (e.g. from diploma to degree programmes); further/higher education; on campus/off campus (i.e. employment, work-based, distance learning); and internationally (i.e. European, transatlantic and global).

A credit accumulation and transfer system is a systematic way of describing an educational program by attacking credits to its components. Credit Hour or Credit Unit is basically the academic currency of the academic activities i.e. units, modules, semesters or programs. The Credit Accumulation and Transfer System (CATS) at King Edward Medical University Lahore have been based upon most commonly used "European Credit Transfer System (ECTS)".

The CATS credits are values allocated to course units to describe the student workload required to complete them. They reflect the quantity of work each course requires in relation to the total quantity of work required to complete a full semester of academic study at the institution, that is, lectures, practical work, seminars, private work – in the library or at home – and examinations or other assessment activities, CATS credits express a relative value.

Key Features of CATS

- i) CATS is based on the principle that 60 credits measure the workload of a full-time student during one academic year. The student workload of a full-time study program in Europe amounts in most cases to around 1500-1800 hours per year (at KEMU 1600 hrs per year), and in those cases one credit stands for around 25 to 30 working hours (at KEMU, clinical training is provided to students in small groups. Especially in postgraduate programs the teacher and student contact is very close). The academic week at KEMU is of 40 hours (Morning and Evening Teaching). One credit is equal to 25 to 30 hours (for both taught and practical training).
- ii) Credits in CATS can only be obtained after successful completion of the work required and appropriate assessment of the learning outcomes achieved. Learning outcomes are sets of competences, expressing what the student will know, understand or be able to do after completion of a process of learning, long or short.
- iii) Students workload in CATS consists of the time required to complete all planned learning activities such as attending lectures, seminars, independent and private study, preparation of projects, examinations, and so forth.
- iv) Credits are allocated to all educational components of a study program (such as modules, courses, placements, dissertation work, etc.) and reflect the quantity of work each component requires to achieve its specific objectives or learning outcomes in relation to the total quantity of work necessary to complete a full year of study successfully.
- v) KEMU – CATS will make study programs easy to read and compare within Pakistan and abroad. CATS will facilitate mobility of students and academic recognition and will help KEMU to organize and revise their study programs.
- vi) The interpretation of foreign grades is a sensitive issue within the field of education as grading system varies from country to country. It provides common procedures to guarantee academic recognition of studies abroad. It provides a way of measuring and comparing learning achievements, and transferring them from one institution to another.
- vii) In CATS normally 30 credits are given for a semester. Credits are awarded when a course has been completed and all required examinations have been successfully taken.

PREPARING PROGRAM SPECIFICATION

i) Introduction

The students must be provided clear and explicit information so that they can make informed choices about their studies and the levels they are aiming to achieve each program therefore must be developed by the universities according "Program Specifications" which identifies intended outcome of the program in terms of

The knowledge and understanding that a student will be expected to have upon completion

Key skills; communication, numeracy, biostatistics, information technology and learning how to learn

Cognitive skills such as understanding ability in critical analysis
Subject specified skills such as laboratory, clinical and therapeutic

ii) **Definitions and Types**

The term program is used in the sense of an institutionally defined curriculum route that leads to a named award, and have following types.

- I. Single major subject program
- II. A joint program combining two subjects each with their own learning outcomes
- III. Interdisciplinary program
- IV. Multi disciplinary program
- V. Split program; one program runs by partly by more institutions.

iii) **Program Specification**

One particular approach to program specifications is not prescribed ; KEMU will wish to consider how the departments present their program specifications and determine their content. It is, however, suggested following information that is normally included in a program specification, is recommended.

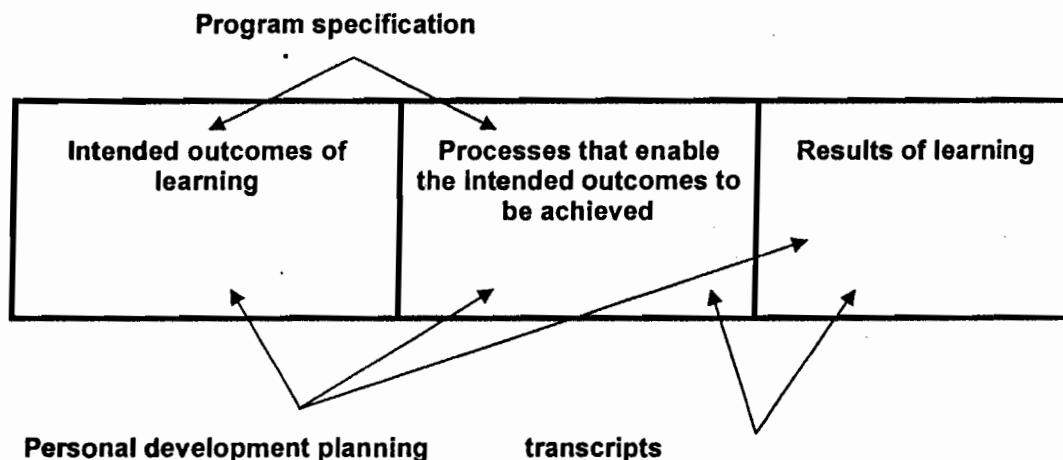
- Awarding body / institution; KEMU, Lahore.
- Teaching institution (if different) (In case of affiliation)
- Details of accreditation by a professional / statutory body
- Name of the final award; M.Phil (subject)
- Program title; as above
- Aims of the program
- Relevant subject benchmark statements and other external and internal reference points used to inform program outcomes
- Program outcomes: knowledge and understanding; skills and other attributes
- Teaching, learning and assessment strategies to enable outcomes to be achieved and demonstrated
- Program structures and requirements, levels, modules, credits and awards
- Date at which the program specification was written or revised
- Criteria for admission to the program
- Information about assessment regulations
- Indicators of quality;
- Particular support for learning
- Methods for evaluating and improving the quality and standards of learning

PROGRAM PROGRESS FILE

The Progress Files

The progress file is a document charting the progress of an individual and showed consist of two elements.

- 1.1 **A transcript** recording student achievement, which should follow a common format, derived by universities through their representative bodies.
 - 1.2 **Personal development planning** undertaken by an individual as a structured and supported process to reflect his or her own learning, performance and/or achievement also known as "Log Book".
- A. Schematic representation of the outcomes approach to learning showing the relationship between program specifications, transcripts and personal development planning.



B. Transcript

The transcript provides a comprehensive verifiable record of learning and achievement of an individual learner. Many HE institutions already provide students with a transcript but there is considerable variation in the information they contain. The progress file provides an opportunity to move towards a more consistent transcript which would:

- Improve the quality and consistency of information on the learning and achievement of individual students in higher education for the benefit of everyone who has an interest in such information;
- Promote awareness of the national qualification frameworks and national and international transparency and recognition of higher education awards;
- Contribute to an individual's lifelong record of learning and achievement;
- Support the process of personal development planning; and
- Encourage good practice in the provision of information on learning the Punjab higher education.

C. Recommended data set for a transcript

Student

Name
Date of birth
Institutional reference number
HE reference number

Qualification

Name of qualification
Level of qualification in National Qualification Framework (NQF)
Name of awarding institution
Name of institution responsible for delivering the program
Language (s) of instruction (to meet HEC requirement)
Language (s) of assessment (to meet HEC requirement)
Professional Body accreditation to be appointed by PMDC.
Statutory Regulatory Body recognition / approval (HEC / PMDC).

Record of learning and achievement

- Name of program
- Module or Sub-module (unit) study
- Title of previous examination
- Date (year) of last examination
- Marks of examination
- Number of attempts to pass last examination

Other Types of Learning within the context of a program

- Rotations X study visits to other institutions
- Work placement
- Work experience
- Accredited prior certificated and experiential learning
- Accredited Key Skills

Award

- Overall marks
- Overall classification or performance indicator (e.g. merit / distinction)
- Professional / statutory Body recognition (Regarding Credit Accumulation and Transfer)
- Date of award

Authentication

- Date of issue
- Signature / seal (to be determined by the University / College / Institution)
- Telephone number for validating information

Explanatory information

- Guidance on how to interpret the transcript (will be developed by universities)
- Overview of the National Qualification Awards Framework (to be issued by the HEC)
- Overview of the HE system (to be issued by HEC)

D. Personal Development Planning

The term personal development planning (PDP) is being used to describe the 'means by which students can monitor, build and reflect upon their personal development'.

Higher education already employs a variety of strategies to encourage students to reflect upon and evaluate their own learning experiences and plan for their own development. A variety of terms are used to describe a process of reviewing and recording learning and achievement, and action planning e.g. Personal Profiling, Personal and Academic Records, Personal (Academic) Development Plans, Progress Files, Learning Portfolios, Learning Logs and Diaries. Many of these terms emphasize that the records are a product of process. The term personal development planning is used in order to emphasize that this is an active learning process undertaken by individuals for themselves.

E. Personal Development Planning Quality Standards

Opportunities and entitlements

The minimum expectations for institutional PDP policies are that:

- At the start of a program, students will be introduced to the opportunities for PDP;
- Students will be provided with opportunities for PDP at each stage of their program.
- The rationale for PDP at different stages of a program will be explained for the benefit of students (e.g. in student or course handbooks or module/unit guides);
- The nature and scope of opportunities for PDP, and the recording and support strategies will be determined by each institution.

These minimum criteria are not intended to constrain existing practice or local initiatives and institutional or local policies are likely to exceed these minimum expectations.

Minimum outcomes

On completion of their program students will have:

- Participated in PDP in a range of learning contexts at each stage or level of their program;
- Demonstrated that they can access and use the aids and tools provided by the institution to help them reflect upon their own learning and achievements and to plan for their own personal, educational and career development;
- With support, created their own learning records containing information on the qualities and skills they can evidence which can be drawn upon when applying for a job or further study.

Information on PDP

- The opportunities for PDP in student programs will be made clear in the program specification and through any other means the institution considers appropriate;
- Students who are applying to study in HE will be informed about the institution's policies on PDP;
- At the start of their program students will be provided with information on PDP in their program including a rationale for the approaches used;
- Students will be provided with information on how they might integrate extra-curricula experiences (for example: voluntary service, part-time employment or work placements, study abroad, fieldwork and working as a student representative or Student Union officer) into their own personal development planning process;
- Students will be provided with information on any ways in which their own evidence of learning might be eligible for accreditation;
- Formal opportunities for PDP in the HE curriculum will be identified in the HE Transcript.

Quality Assurance

- Institutions will be expected to have mechanisms to assure themselves that PDP is being implemented effectively.
- Guide line for the academic staff to explain expectations of the Personal Development Planning (PDP) to enable students to describe their own learning, performance or achievement and to plan their personal, educational and career development.