

# SYLLABI AND COURSES OF STUDIES IN M.PHIL FORENSIC MEDICINE & TOXICOLOGY

## A. Major (compulsory) Course:

MCQ's Paper	150 Marks	150 Items	3 Hours
SEQ's Paper	150 Marks	15 Items	3 Hours
Viva voce & Practical exam.	100 Marks		
Total	400 Marks		

## Contents of courses

### I. **General Forensic Medicine**

#### 1. Laws related to medical man

- i. Law and its types. Courts and their types, powers & jurisdiction. Important legal terms.
- ii. Evidence act and evidence recording before the court of law, Guidelines for medical man when appearing in court as a witness.
- iii. Statutes relevant to death investigation & medico-legal practice in Pakistan like section 174 & 176 PPC, Relevant sections of Police Rules 1934, Qisas & diyat act 1997. Death investigation systems in other countries like Coroner System, Medical Examiner System and Continental System.
- iv. Statutes controlling medical practice like PMDC ordinance 1962, Allopathic system (prevention of misuse) act 1962, Medical & dental degree ordinance 1982, Drug Act, The Control of Narcotic Substances Ordinance 1995.
- v. Ethical aspect of medical practice. Role of ethics while dealing with research, euthanasia & artificial insemination.
- vi. Legal aspect of medical treatment like consent, medical negligence, professional secrecy & privileged communications, Injured Persons (medical aid) Act 2004, Human tissue & organ transplant act 2007. Evolution of concept of compensation from common law torts to Social Security Ordinance 1965. Medical documents.
- vii. Statutes relevant to sexual assaults like Haddood ordinance 1979, Protection of Woman Act 2006.
- viii. Statutes for care & preservation of rights of mentally sick people like Mental Health Ordinance 2001.
- ix. Statutes related to miscarriage like isqat-haml & isqat-janin,
- x. Statutes related to marital issues, like Child marriage restraint act 1989, Dissolution of Muslim marriage act 1989. Muslim family laws 1961.

#### 2. Personal Identity

Parameters of identification, methods of identification in living & dead including decomposed, mutilated bodies, fragmentary & skeletal remains. Role of various identification techniques like dentistry, radiology, dactylography, superimposition photography, DNA finger printing. Determination of age, sex & race by various methods & its medico-legal aspects.

3. Trace Evidence  
Application of Locard's principle of exchange in criminal cases, study of scene of crime, collection preservation and dispatch of trace evidence material to lab. Examination of biological specimens of forensic importance like Blood, Semen, Saliva, Vomitus, Breath, Urine, Hair and their examination in the laboratory.
4. Thanatology  
Evolution of concepts regarding definition & diagnosis of death. Cause, manner, mode & mechanism of death. Death related issues like death certification according to WHO guidelines, death registration. Causes of sudden unexpected deaths with emphasis on coronary heart diseases & neurogenic cardiovascular failure. Physico chemical changes after death in various body tissues, organs and fluids under various environmental conditions. Estimation of time since death.
5. Autopsy.  
Types, objective, autopsy protocol, procedure/techniques of autopsy. Postmortem artifacts, negative autopsy, risk and hazards & precautions in autopsy practice.  
Collection, preservation, labeling & dispatch of biological & non biological materials to laboratory. Establishment of modern autopsy laboratory. Procedure of exhumation its value & limitations.
6. Traumatology  
Definition of wound, mechanism of wound production, classification, cause effect relationship of various weapons including firearms & explosives, Age of wound. Examination of injured person & certification of nature, cause, manner and dating of wounds, Determination of complications, disability and cause of death from wounds. Distinguish between self inflicted, suicidal, homicidal & accidental injuries antemortem and postmortem injuries. Relationship of trauma to disease. Presumption of survivorship and death.

## **II. Special Forensic Medicine**

1. Special traumatology  
Regional injuries, Firearm and explosive injuries, Transportation injuries (road traffic accidents, railway accidents, air crashes) Police torture injuries & custodial deaths.
2. Environmental hazards  
Burns, electrocution, lightning, radiation, cold, heat, starvation.
3. Asphyxial deaths  
Classification & physio-chemico-pathological changes in asphyxial deaths. Suffocation, Hanging, Strangulation, Throttling, Sexual Asphyxia, Traumatic Asphyxia, Environmental Asphyxia, Drowning, Scuba diving.
4. Medicolegal aspects of marriage.  
Virginity, impotence, pregnancy, delivery, legitimacy, contraception, artificial insemination, abortion (criminal & justified), nullity of marriage.

5. Sexual offences.  
Classification of sexual offences, Examination of offender and victim and collection, preservation and dispatch of biological material to laboratory. Sexual perversions.
6. Crime against new born / infant / child  
Infanticide, child abandonment, child abuse, stillbirths, cot deaths.
7. Forensic Psychiatry  
Various psychiatric terms. Principles of constitution of crime and grounds for diminished civil and criminal responsibilities. Distinguish between true and feigned insanity.
8. Forensic Sciences  
Introduction to Forensic Sciences, scope and importance of various disciplines like photography, dactylography, odontology, anthropology, questioned documents, tool marks, ballistics, and DNA fingerprinting.
9. Forensic aspect of various specialties, like anaesthesia, surgery, radiotherapy, etc.

### **III. Forensic Pathology:**

1. Morphology of myocardial infarction
2. Morphology of thrombo-embolism and pulmonary infarction
3. Morphology of Pneumonia
4. Morphology of Pulmonary Tuberculosis.
5. Morphology of bronchogenic Carcinoma.
6. Morphology of pneumoconiosis.
7. Morphology of tumours of stomach and intestines.
8. Morphology of heavy metal poisoning.

### **IV. Forensic Anatomy:**

1. Assessment of age, sex, race, stature & evidence of trauma / poisoning from skeleton.
2. Study of dentition for assessment of age.
3. Study of human & animal hair
4. Fertilization and development of placenta.
5. Assessment of foetal age.

### **V. Forensic Serology:**

1. Morphology of human and other species RBC's
2. Various blood group systems and laws of inheritance of blood groups & their role in resolving paternity and maternity issues
3. Forensic importance of blood stains and their detection in the laboratory.
4. Principles and technique of various serological tests. Application of Precipitin Test for detection of human tissues.
5. Secretors and non secretors.
6. Method of forward and backward blood grouping and cross matching.
7. Hazards of blood transfusion

## **VI. Forensic Biochemistry**

- i. Clinical biochemistry:  
Biochemical changes in muscles, blood, CSF & vitreous after death.  
Biochemistry of asphyxia and drowning.  
Biochemical changes in wounds.
- ii. Analytical biochemistry:  
Analytical techniques for detection of drugs and poisons Principles of modern techniques like (spectrophotometry, atomic absorption spectrophotometry, mass spectrophotometry, flame photometry, chromatography, electrophoresis.
- iii. Genetics:  
Structure of DNA, replication, DNA profiling and its role in Forensic Medicine. Method of collection / preservation of samples to be sent to DNA laboratory.

## **VII. Forensic Radiology**

Technique of radiology and its use in Forensic Medicine practices.

## **VIII. Toxicology**

### **General Toxicology:**

Definition, scope, classification of poisons, Drug dependence, Diagnosis of intoxicated cases in acute and chronic exposure in living and dead. Factors affecting outcome. General management of case of poisoning and including legal duties of doctor in handling such cases.

### **Specific Poisons:**

Poisons/drugs of abuse prevailing in our society along with medicolegal aspects.

- i. Alcohol.
- ii. Opiates, and other narcotics
- iii. Salicylates and paracetamol
- iv. Hypnotics and sedatives
- v. Stimulants Cocaine, cannabis
- vi. Poisonous Plants (Aconite, Belladonna, Hyoscyamus, Stramonium, Digitalis, Ergot, Mushrooms, Nux Vomica, Oleander, Tobacco)
- vii. Venomous insects (Snakes)
- viii. Inorganic elements, Antimony, Arsenic, lead, Mercury, Phosphorus
- ix. Volatile poisons and Carbon monoxide, Hydro carbons, Cyanides, Corrosives (Hydrochloric acid, Nitric acid, Sulfuric acid, Oxalic acid, Carbolic acid and Alkalies)
- x. Pesticides, herbicides and insecticides

## **PRACTICAL TRAINING**

The trainee shall be attached for the period of two years with the department of Forensic Medicine and Toxicology, Postgraduate Medical Institute & Lahore General Hospital, Lahore. During his attachment with the department the trainee should attend lectures, demonstrations, Clinico-Pathological conferences, seminars and journal club meetings arranged by the department. In addition, he is required to present cases of general interest in the Clinico-Pathological

conferences. The trainees would be required to take part in the routine work (teaching) and academic activities of the department.

The trainees would be posted in the following departments on rotation basis, as per following schedule, for practical training.

#### **YEAR-I**

	<b><u>Vennue</u></b> <b><u>Duration</u></b>	<b><u>Minimum</u></b>
1.	<b>Medico-Legal Clinic</b> <b>Months</b>	<b>6</b>
	<b>Objectives:</b> To observe and conduct Medico-legal examination and learn the art of Medico-legal certification.	
2.	<b>Serology/ Haematology Laboratory</b> <b>Month</b>	<b>1</b>
	<b>Objectives:</b> To learn various serological tests related to field of Forensic Medicine	
3.	<b>Histopathology Lab</b> <b>Month</b>	<b>1</b>
4.	<b>Court Attendance</b> <b>Weeks</b>	<b>2</b>
	<b>Objectives:</b> To observe court procedure, proceedings And learn to act as expert witness.	
5.	<b>Dentistry</b> <b>Weeks</b>	<b>2</b>
	<b>Objectives:</b> To learn the nomenclature, international Charting and role of dentistry in Forensic Medicine.	

#### **YEAR-II**

1.	<b>Autopsy Lab / Mortuary</b> <b>Months</b>	<b>6</b>
	<b>Objectives:</b> To observe/ conduct Post-Mortem Examination and to learn reports writing.	

2. **Chemical Examiner to Govt. of Punjab** 1  
**Month.**

**Objectives:** To Learn various qualitative and  
Quantitative analytical techniques.

3. **Radiology Department** 1  
**Month**

**Objectives:** To learn and interpret various radiological/  
Ultrasound findings relevant to field of Forensic Medicine.

4. **Ballistics / Forensic Science Laboratory** 1  
**Month**

**Objectives:** To learn about various detection  
techniques performed.

**B. 1<sup>st</sup> Minor (elective) course**

General Pathology      100 Marks      100 Items      2 Hours

**C. 2<sup>nd</sup> Minor (elective) course**

2<sup>nd</sup> Minor      100 Marks      100 Items      2 Hours

One elective course should be selected from the following,

1. Chemical Pathology
2. Haematology
3. Immunology & Serology
4. Cytogenetics

**D. Thesis**

Thesis Examination      200 Marks

### **Suggested Readings:**

1. The human skeleton in Forensic Medicine: By Wilton Marion Krogman, published by Charles C. Thomas, Springfield, Illinois, U.S.A.
2. Forensic Dentistry: By J.M. Cameron and E.G. Sims, forwarded by Prof. C. Keith Simpson, published by Churchill Livingstone, Edinburgh and London.
3. Blood Group Serology: by Kathleen E. Boorman, Barbara B. Dodd, and P.J. Lincoln. Published by Churchill Livingstone, Edinburgh & London.
4. Forensic Science: By M.J. Walls, published by Sweet and Maxwell.
5. Postmortem Procedures: By G. Gresham, and A. F. Turner. Published by Wolfe Medical Publications LTD.
6. The Pathology of Violent Injury: By J.K. Mason, Published by Edward Arnold.
7. Noys' Modern Clinical Psychiatry: By Lawrence C. Koib, Published by W.E. Saunders Company.
8. Modern Legal Medicine, Psychiatry and Forensic Science: By William J. Curran; A. Louis McGarry; Charles S. Petty. Published by F.A. Davis Company.
9. Forensic Medicine (Three Volumes): By C.G. Tedeschi, William G. Eckert, Luke G. Tedeschi. Published by W.B. Saunders Company.
10. Gradwohl's Legal Medicine: By Francis E. Camps. Published by Bristol, Joirn Wright and Sons Ltd.
11. A Textbook of Pathology: By William Boyd, published by Lea and Febiger.
12. Gray's Anatomy, Applied and Descriptive.
13. Kent: Comparative Anatomy.
14. Bomb scene investigations.
15. DNA & Criminal justice—the technology of justice.

16. Digital Forensics & Digital Evidence.
17. Introductions to statistics for Forensic Scientists.
18. Computer Forensic investigations
19. Verbal autopsy standards: Ascertaining & Attributing cause of death by WHO.
20. Principles & Practice of Forensic Medicine by Nasib R. Awan
21. Robbin's Pathologic basis of disease
22. Knight's Forensic Pathhology
23. Hand book of Forensic Pathology by Dimaio

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