



Study Guide: **“Forensic Medicine & Toxicology.”**

3rd Year MBBS

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Department in a Glance

The Department has a well-equipped lecture theatre, forensic lab and a forensic museum. The lab consists of serology test facilities. It also has glassware, chemicals and analytical equipment for the purpose of toxicology teachings. The forensic lab is fully equipped with latest apparatuses, multimedia and computers, good artistic models, flexes, weapons, crime scene posters and medicolegal photographs. There are many poison specimens in the museum. This whole arrangement is meant for giving latest scientific knowledge to the medical students and they are being trained for autopsy, medico legal work and other aspects of the subject. The department has an air-conditioned lecture theatre, an air-conditioned forensic laboratory, and forensic museum and demonstration/tutorial rooms. Forensic medicine brings the investigative capabilities of modern medicine to the aid of law and justice. Students have an opportunity to apply knowledge of the various sciences to the human body. Students are taught about different aspects of forensic medicine. The faculty members keep themselves updated of latest developments in the international scene. Teaching of medical students is made by general lectures, demonstrations and tutorials making use of multimedia, computers, models, specimens, microscopes. This department is also affiliated with forensic department of Punjab Medical College Faisalabad for learning of autopsy/ medicolegal work. Third year MBBS class students visit mortuary and medicolegal clinic of Faisalabad Medical University (FMU) and practically see the dead bodies and autopsy work being done. This is meant for training the medical students in forensic work appropriately. This department comprises of trained and skilled teaching faculty along with trained lab staff.

Department Team

Position	Name
Head Of Department	Associate Professor Dr. Khurram Sohail Raja
Demonstrator	Dr. Asma Yahya
Demonstrator	Dr. Muhammad Asfand Yar
Demonstrator	Dr. Ayesha Ramzan
Computer Operator	Muhammad Qasim
Lecture Hall Attendant	Muhammad Bilal
Laboratory Attendant	Muhammad

Timeline for Syllabus Completion

Topic	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Traumatology	■									
General Toxicology		■								
Personal Identity		■								
Examination of Biological Specimens			■							
Autopsy			■							
Thanatology			■							
Violent Deaths due to Asphyxia				■						
Special Toxicology					■					
Law related to Medical Men						■				
Pakistan's Legal System							■			
Forensic Sexology							■			
Sexual offenses							■			
Miscarriages								■		
Crime against Newborns, infants and children								■		
Forensic Psychiatry								■		

Time Table

Days	1	2	3	4	5	6	7
Time is variable and updated weekly depending on circumstances by Department of Medical Education. Class is divided into three batches for tutorials and practical classes.							
Monday	Test				Practical Batch #1	B	Practical Batch #2
Tuesday				Tutorial Batch #1	Practical Batch #3	R	Lecture
Wednesday	Lecture				Tutorial Batch #2	E	Lecture
Thursday					Tutorial Batch #2	A	
Friday		Lecture				K	
Saturday					Lecture	-	

Syllabus Outline

1. FORENSIC MEDICINE

- a) Pakistan's Legal System
- b) Forensic Sciences: Role of Forensic Sciences in crime detection.
- c) Law in relation to medical men:
- d) Personal Identity
- e) Thanatology
- f) Traumatology
- g) Violent deaths due to asphyxia
- h) Autopsy
- i) Forensic Sexology.
- j) Sexual offences and relevant sections of law (Zina and Hudood Ordinance)
- k) Miscarriage Medico-legal aspects applicable to miscarriage examining mother and aborted material.
- l) Crime against new born, infants and child.
- m) Forensic Psychiatry
- n) Examination of biological specimens

2. TOXICOLOGY

- a) General principles of Toxicology
- b) Autopsy techniques with collection, preservation and dispatch of biological material to analytical laboratory.
- c) Specific Poisons Poisons/drugs of abuse prevailing in our society along with medico-legal aspects:
 - i) Alcohol
 - ii) Opiates, opioids 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 corrosives (carbon monoxide, hydro carbons, cyanides, sulfuric acid, oxalic acid, carbolic acid and alkalis)
 - x) Pesticides, herbicides and insecticides.

Learning Objectives

Topic	Sub topic	Learning Objectives
Welcome to new class	Introduction to Forensic Medicine	Define forensic medicine
		Enlist the branches of forensic medicine
		Discuss role of forensic medicine in MBBS
	Introduction to Toxicology	Define Toxicology
		Discuss general aspects of toxicology
	Subjects related with forensic medicine	Enlist various branches of forensic medicine
Describe role /links of various branches in forensic medicine		
Pakistan's Legal System	Introduction to Law	Define legal procedures n forensic medicine
		Enlist legal procedures
		Analyze role of legal procedures in forensic medicine
	Law	Define Law
		Enlist Examples of Law in Medicine
		Classify law (civil /criminal law)
		Compare various kinds of laws
	Courts in Law	Classify courts
		Describe powers given to various courts
		Visit to the court
		Describe working of court
		Describe a court map
		Define Evidence
	Evidence	Classify Evidence
		Describe Direct evidence
		Discuss indirect evidence with case scenarios
		Describe Circumstantial Evidence with case scenarios

		Describe dying declaration
		Describe dying deposition
		Describe role of medical doctor in the medicolegal system
	Witness	Define witness
		Enlist types of witness
	Medicolegal systems	Describe different medicolegal systems for injuries, hurts and deaths in the world
		Describe modified continental system in Pakistan
	Stages of Evidence	Describe police inquest, coroner's inquest and magistrate inquest
		Describe protocol for recording of evidence in court
		Describe examination in chief ,cross examination, re-examination
	Procedure for calling in the court	Describe Sumons
		Describe Subponeoa
		Describe Warrant
		Describe Conduct Money
	Criminal Justice	Describe general presumptions of law
		Describe general exceptions?
	Criminal responsibility	Define criminal responsibility
		Describe factors which can negate criminal responsibility
		Describe MC naughtens rule
		Define following
		Oath, injury, assault, affidavit, unfit to plead, guilty but insane, deposition, testimony.
		Conduct money, borstal jail, cognizable and non-cognizable offence, crime, offence
		Describe principles for giving evidence in court
		Describe role of Forensic Medicine in Crime Detection
	PMC	Enlist the functions of PMC

		Describe the functions of PMC
RMP		Enlist and explain the privileges of RMP
		Enlist and explain the obligations of RMP
Medical Ethics		Define and explain medical ethics, professional misconduct, infamous conduct
		Describe medical ethics, professional misconduct, infamous conduct
Medical Negligence		Enlist/Describe abuses of RMPs
Abuses of RMPs		Describe the procedure for grant of registration for Medical Graduates
		Describe the procedure for disciplinary proceedings against an RMP
Drug Acts		Enlist the objectives of drug 1976
		Enlist the objectives of Dangerous drug act 1930
		Define Drug addiction
		Discuss drug addiction
		Define Drug dependence
		Discuss Drug dependence
		Define Drug abuse
		Enlist Dangerous Drug Rules 8,13,14
		Enlist the objectives of Dangerous drug rules 8, 13,14
		Define temporary reception, voluntary reception, reception order
Treatment of mental illness		Describe temporary reception, voluntary reception, reception order
		Describe procedure for discharge of mentally ill person from mental asylum
		Define Consent
Consent		Classify Consent
		Describe implied consent, informed consent, expressed consent
		Compare implied consent, informed consent, expressed consent

		Describe blanket consent
		Describe consent recoding procedure
		Describe standard procedure, modified of procedure, with holding of consent
		Describe consent for organ transplantation,
		Describe the legal position of AIH
		Describe pros and cons of organ transplantation.
		Evaluate a personal view of artificial insemination
		Describe moral view of therapeutic abortion
		describe moral view of euthanasia
		Describe relationship between biomedical research and highest ethical standards
	Medical Negligence	Define Medical negligence
		Classify Medical Negligence
		Define civil negligence
		Describe civil negligence
		Define criminal negligence
		Describe criminal negligence
		Define contributory negligence
		Describe contributory negligence
		Describe third party negligence
Describe res ipsa loquitur		
Describe Professional Secrecy		
Define Privileged Communications		
Enlist Privileged Communications and explain (absolute privilege, qualified privilege, disclosure of secrets of patient)		
Traumatology	Wound Production	Define wound
		Enlist types of bruises
		Describe mechanism of would production

		Define mechanical Injuries
		Classify mechanical Injuries
		Enlist factors affecting wound production
		Enlist types of weapons
		Classify abrasions
		Describe mechanism of production of abrasions
	Bruises	Describe types of bruises
		Describe mechanism of production of bruises
		Define laceration
		Enlist types of lacerations
		Describe types of lacerations
	Mechanical Injuries	Describe features of incised wound
		Describe penetrating wound
		Describe perforating wound
		Describe stab wounds
		Describe regional injuries
		Differentiate between fabricated injuries and true injuries
		Identify types of abrasions on model
		Identify types of bruises on model
		Identify types of laceration on model
Identify incised wound on model		
Identify stab wound on model		

		Identify penetrating wound
		Identify perforating wound
		Define transportation injuries (road traffic injuries)
		Describe transportation injuries (road traffic injuries)
		Evaluate medicolegal importance of different injuries
		Describe complications of wounds
		Describe complications of injuries
		Describe crush syndrome
		Describe injuries caused in police torture
		Identify transportation injuries model
		Identify wound complications on model
		Identify common wounds
		Enumerate methods of treatment of mechanical injuries
		Apply appropriate method of treatment in various mechanical injuries
		Describe method of stitching of superficial wound
		Describe medicolegal aspects of heat injuries
		Describe medicolegal aspects of cold injuries
		Describe medicolegal aspects of electrical injuries
		Observe examination protocol in medicolegal cases
		Observe nature of hurts
		Define firearm weapon

		Enlist different types of weapons, identify different types of weapons
		identify different types of firearm projectiles
		Describe different types of firearm bullets
		Describe different types of firearm pellets
	Firearm Injuries	Enlist various types of Ballistics
		Describe Internal ballistics
		Describe External ballistics
		Describe Terminal ballistics
		Define Entry wound
		Define Exit Wound
		Describe mechanism of firearm entry wound
		Describe mechanism of firearm exit wound
		Describe feature of firearm entry wound
		Describe features of firearm exit wound
		Identify entry wound on model
		Identify exit wound on model
		Differentiate between firearm entry and exit wound
		Describe firearm blackening around entry wound
		Describe tattooing around entry wound
		Describe collar of abrasion around entry wound
Analyzing distance and direction of fire		
Enlist factors affecting diameter, size, shape of firearm entry wound		
Categorize firearm injuries by different types of firearm weapons		

		Describe Tail wag phenomenon
		Describe bullet Yaw
		Describe trajectory of the bullet
		Describe tumbling of the bullet
		Describe Ricocheting Phenomenon
	Effects of heat, cold, electricity on human body	Describe complications of excessive heat (burns)
		Describe types of burns
		Describe rule of nine for percentage of burns
		Describe medicolegal examination protocol of case of burns
		Describe effects of excessive heat on human body
		Describe complications of cold on humans, autopsy findings
	Lightening	Describe effects of electrocution
		Describe effects of lightning
	Starvation	Describe complications of starvation on humans
Describe features of starvation on dead body (autopsy findings)		
Thanatology	Death	Describe scientific concept of death
		Enlist indicators of death
		Enumerate the WHO criteria for diagnosis of death
		Define brain death
		Describe brain death
		Define vegetative state
		Describe vegetative state

		Enlist causes of sudden death
		Enlist causes of unexpected death
		Define the terms, cause, manner and mode of death
		Describe early physiological changes after death
		Describe late physiological changes after death
		Describe death on police custody
		Fill a proforma of Certificate of Death according to WHO guidelines
		Diagnose suicidal death
		Diagnose Homicidal death
		Diagnose accidental death
		Describe early and late changes after death
		Asphyxia
	Classify asphyxia	
	Describe features seen on body due to mechanical asphyxia	
	Describe features seen on body due to chemical asphyxia	
	Describe features seen on body due to environmental asphyxia	
	Analyze medicolegal implications of violent asphyxia	
	Explain mechanism of death due to drowning	
	Describe features seen on body due to drowning	
	Differentiate between antemortem and postmortem drowning	
Identify various forms of asphyxia on model		
Identify features of drowning on a model		

	Autopsy	Define autopsy
		Enlist types of Autopsies
		Enlist objectives of autopsy
		Enlist rules regarding autopsy
		Describe the techniques used in autopsy
		Describe procedure of autopsy
		Define fatal period
		Describe methods for estimating time since death.
		Describe postmortem artefacts.
	Drowning	Describe fresh water drowning
		Describe salt water drowning
		Describe antemortem drowning
	Infanticide	Define infanticide
		Define live born, still born, dead born
		Describe features of live born, still born and dead born
		Determination of age of embryo
		Determination of age of fetus
	Starvation	Describe effects of starvation on humans
	Autopsy & Exhumation	Describe the risks/hazards of autopsy
		Describe autopsy Protocol
Define autopsy Index		
Define negative autopsy		
Enlist steps in sending viscera to a pathologist/chemical examiner		

		Describe procedure for selecting viscera
		Describe procedure for preserving viscera
		Describe procedure for labeling viscera
		Describe procedure for dispatching viscera for sending to pathologist.
		Define exhumation
		Describe the procedure of exhumation
		Explain medicolegal importance of exhumation
		Enlist limitations of Exhumation
		Observe Autopsies
		Visit Site of Exhumation
	Hurt	Define Hurt
		Classify hurt
		Enlist examples of types of Hurt
		Define Qatal
		Enlist types of Qatal
		Describe types of Qatal with examples.
		Describe protocol of examination of medicolegal injuries
		Write MLC report
Forensic Sexology	Virginity and Pregnancy and delivery	Define virginity
		Describe features of virginity
		Describe features of pregnancy
		Describe features of recent delivery
		Describe features of remote delivery
Forensic Sexology	Abortion	Define abortion
		Classify abortion
		Describe types of abortion

		Analyze the legal position of abortion in Pakistan
		Define criminal abortion
		Describe methods for procuring criminal abortion
		Describe features of criminal abortion
		Describe features of criminal abortion on a victim's body living and dead
		Describe protocol for writing sexual report
		Describe protocol for writing sexual fitness report
		Describe protocol for writing non fitness report
		Define sexual Perversions
		Enlist types of sexual perversions
		Describe sexual perversion
		Describe the causes of sexual perversions
	Sexual Offences (Zina and Haddood Ordinance)	Describe natural sexual offences
		Describe unnatural sexual offences
		Describe protocol of examination of victim of sexual offence
		Describe protocol of examination of assailant of sexual offence
		Describe collection of samples for sexual offense case
		Describe procedure for dispatching sample for sexual offense case
		Observe cases of Sexual offense
		Observe cases of male sexual potency
		Writing a sexual potency report
		define still born

		Define Dead born
		Define Infanticide
		Define Live born
		Define still born
		Describe features of virginity, pregnancy and delivery
Infanticide	Infanticide	Describe features of recent delivery and remote delivery on living and dead
		Describe different types of abortion, legal position of therapeutic abortion in Pakistan
		Define criminal abortion, describe different methods for procuring criminal abortion
		Define Dead born
		Describe methods to diagnose stillborn
		Describe methods to diagnose liveborn
		Describe methods to diagnose dead born
		Describe hydrostatic test
		Enlist the limitations of hydrostatic tests
		Define Maceration
		Define Putrefaction
		Differentiate between maceration and putrefaction
		Describe procedure for sending aborted material to histopathologist for examination.
		Describe procedure to determine age of embryo

	SIDS	Describe SIDS
	Battered baby syndrome	Describe Battered baby syndrome
	Battered wives	Describe Battered wives
Personal identity	Introduction	Define personal identity
	Dactylography	Describe parameters of personal identify.
		Enlist techniques of identification including using special techniques
		Describe identification of living, dead, decomposed, mutilated and burnt bodies
		Analyze the role of dactylography in personal identity
	Age Estimation	Describe ages of medicolegal importance
		Describe age estimation parameters in humans
		Describe role of teeth on human age estimation
		Describe role of bones in age estimation
		Describe the information one can get from bones subjected for medicolegal examination.
		Describe role of human skull in age estimation
		Describe role of human mandible in age determination
	Sex Determination	Describe parameters for sex determination
		Describe sex determination from male and female pelvis
		Describe sex determination from human skull
		Enlist differences in male and female skull
		Sex determination.

		Describe role of nuclear sexing, baar bodies and drum stick
Race determination		Describe cephalic index, its importance in race determination
		Describe nasal index, sciatic notch index, sacral index, sternal index
DNA role in identity		Describe structure of human DNA
		Define DNA profiling
		Describe role of DNA profiling in personal identity
		Describe role of DNA profiling in identification of parents
		Describe role of DNA profiling in identification of criminals and assailants
Human hair		Describe structure of human hair
		Enlist the differences between human hair and animal hair
		Describe role of human hair in personal identity and in criminology
		Describe role of human hair in criminology
Trace evidence		Define trace evidence
		Describe types of trace evidence
		Describe role trace evidence in forensic criminology
		Describe blood groups
		Describe forensic importance of human blood groups
		Describe Locard Exchange Principle
		Explain forensic importance of Locard Exchange Principle
	Describe collection of different samples for lab analysis applied in forensic practice	
	Describe cases of disputed paternity and maternity	

		Describe cases of disputed maternity
		Describe secretors
		Describe method of identification of biological specimen including human semen, human saliva, breath and urine
		Describe method of collection of above biological specimen
		Describe method of preservation of above biological specimen
		Describe method of dispatch of above biological specimen
		Describe the laboratory tests to be performed on above biological specimen
		Describe parameters to diagnose mental illness
	Insanity	Describe features of insanity
		Differentiate between true and feigned insanity
	Biological Specimen	Perform examination of blood slide
		Identify human RBC on slide
		Identify Animal RBC on slide
		Identify WBCs on slide
		Describe the life span of human RBCs
		Prepare a slide of human hair
		Prepare a slide of animal hair
		Prepare a slide of cloth fibers
		Identify human and animal hair
		Differentiate between human and animal hair.

		Observe the techniques of poison detection and histopathological examinations
	Basics of Toxicology	Describe scope of toxicology
		Enlist laws related to homicidal poisoning
		Enlist laws related to suicidal poisoning
		Enlist causes of drug dependence
		Describe the fate of poison in biological tissues
Toxicology		Describe the process of detoxification of poison in biological tissues
		Describe parameters used to diagnose toxicological cases in acute and chronic exposure in living
		Describe parameters used to diagnose toxicological cases in acute and chronic exposure in dead.
		Classify poisons
		Describe factors affecting dosage of poisons
		Describe factors affecting toxicity of poisons on humans
		Describe methods of excretions of poisons from human body
		Define gastric lavage
		Describe procedure of gastric lavage
		Enlist indications for gastric lavage
		Enlist contra-indication for gastric lavage
		Enlist complications of gastric lavage
		Describe management of a in emergency of a hospital case of acute poisoning
		Enlist the steps for maintenance of vital systems of humans

		Describe duties of duty doctor in case of poisoning
		Describe protocol of preparation of chemical examiner report
	Gastric Lavage	Define antidotes
		Classify Antidotes
		Describe the functions of antidotes
		Describe alcohol toxicity in humans
		Describe alcohol metabolism in humans
		Describe alcohol dosage in humans
		Describe alcohol excretion in humans
	Antidotes	Describe toxic effects of alcohol in humans
		Define antidotes
		Describe types of antidotes
		Describe mechanism of action of antidotes
	Alcohol	Describe alcohol toxicity in humans
	Special Poisons	Describe opiates, opioids, opium and heroin poisoning on human
		Describe management of opiates, opioids, opium and heroin poisoning
		Describe treatment of opiates, opioids, opium and heroin poisoning on human
		Describe salicylates poisoning
		Describe paracetamol poisoning
		Describe hypnotics poisoning
Describe sedatives poisoning		

		Describe cocaine poisoning
		Describe dhatura poisoning
		Describe canabas toxicity
		Enlist management of poisons
		Describe aconite, belladonna, hyoscyamus, stramonium, digitails, ergot, mushrooms, nux vomica, oleander and tobacco.
		Describe inorganic elements poisoning including arsenic, lead, mercury, phosphorus, antimony, thalium poisoning and management of all of them
		Describe management of inorganic elements poisoning.
		Describe insecticides poisoning rodenticides and management
		Describe management of insecticides poisoning
		Describe rodenticides poisoning
		Describe management of rodenticides poisoning
		Describe hallucinogenic drugs
		Describe deliriant poisons
		Describe the hydrocarbon poisoning (kerosine oil, gasoline, xylene, glue sniffing)
		Describe poisonous insect toxicity
		Describe management of poisonous insect toxicity
		Describe snakes' toxicity
		Describe management of snake's toxicity
	Practical Work	Preparation of toxicology note book

		Preparation of forensic note book
		Interpreting x-rays for trauma, age estimation

Practical List:

- Practical work will include;

1. In Forensic Medicine:

- Autopsies
- Medico-legal examination of injured
- Estimation of age and forensic radiology
- Sexual assaults and sex-related cases (impotence, pregnancy, etc.).
- The procedure of preservation, dispatch of biological and other evidentiary material.
- Practical in the biological laboratory (identification of blood, semen, saliva, etc.).
- The procedure of consent taking and medical certification.

2. In Toxicology: Students should have an understanding of and be able to describe:

- Diagnostic and management process (alcohol, narcotics and insecticide poisons).
- Collection, preservation and dispatch of biological materials.
- Visual, olfactory and tactile identification of common poisons found in communities and country.

3. Visits: For proper orientation and practical demonstration, visits are also suggested to a:

- Court.
- Forensic science laboratory.
- Psychiatric unit or jail
- Site during conduction of exhumation.

Learning Methodology:

Recommendations are as under:

A) Theory in the form of tutorials, seminars, videos and lectures

B) Practical in the form of:

- Demonstrations
- Posting in autopsy rooms
- Postings such as in medico-legal clinics / casualty departments / poison centers.
- Experiments in biological laboratory.

C) Visits.

Assessment Methodologies and Feedback:

Periodical tests will provide feedback to the teachers and assess the adequacy of learning.

We use:

- Monthly Tests
- Written Assessments
- Viva-voce
- OSPE Tests
- One-on-one feedback and counseling sessions
- Test result discussion sessions
- Attendance feedback discussion
- Open feedback from students
- Anonymous feedback through class representatives of the students
- Meetings to improve teaching methodologies in accordance with feedback received.

Textbook and References:

1. Simpson's Forensic Medicine by Barnard Knight, 11th Ed., Edward Arnold, London.
2. Parikh's Text book of Medical Jurisprudence, Forensic Medicine and Toxicology by C.K. Parikh 6th Ed., CBS Publisher.
3. Buchanan's Text book of Forensic Medicine and Toxicology by Buchanan, 9th Ed., Livingstone.
4. G. Principles and Practice of Forensic Medicine by Prof. Nasib R. Awan.
5. Medical Jurisprudence and Toxicology by Dr. Siddique Hussain.

TABLE OF SPECIFICATIONS FOR FORENSIC MEDICINE:
THEORY PAPER THIRD PROFESSIONAL

CONTENTS		SEQs	MCQs
1.	No set pattern	5	
2.	No set pattern	5	
3.	No set pattern	5	
4.	No set pattern	5	
5.	No set pattern	5	
6.	No set pattern	5	
7.	No set pattern	5	
8.	No set pattern	5	
9.	No set pattern	5	
TOTAL ITEMS		9	45
TOTAL MARKS		45	45

25% of MCQs and SEQs should be clinically oriented or problem- based.

10% marks are allocated for 'Internal Assessment'

Total marks for theory paper: SEQ+ MCQ + Internal Assessment =45+45+10 =100 Marks

ORAL AND PRACTICAL EXAMINATION THIRD PROFESSIONAL

Oral and practical examination carries 100 marks.

EXAMINATION COMPONENT		MARKS
A	OSPE	40
B	Viva	40
C	Yearly Workbook	10
D	Internal Assessment	10

Total marks= 40+40+10+10=100 Marks