



Department - Forensic Medicine & Toxicology

PG Curriculum

1. Goals

The **Goal** of MD Forensic Medicine & Toxicology is to train a doctor to become a competent medico-legal expert, teacher and researcher in the subject who:

- 1 is aware of medico legal aspects in various settings
- 2 is aware of contemporary advances and developments in the field of Forensic Medicine.
- 3 has acquired the competencies pertaining to the subject of Forensic Medicine that are required to be practiced at all levels of health system.
- 4 is oriented to the principles of research methodology.
- 5 has acquired skills in educating and imparting training to medical, paramedical and allied professionals.

2. Outcomes

2.1 Cognitive

- 1 Acquire knowledge on the philosophy and guiding principles of Forensic Medicine course.
- 2 Acquire knowledge and perform medico-legal autopsy independently with required physical assistance, prepare report and derive inferences.
- 3 Acquire knowledge and perform medico-legal examination of users of alcohol, drugs and poisons and prepare report.
- 4 Acquire knowledge and perform medico-legal examination in cases of sexual offences and prepare report.
- 5 Interpret histo-pathological, microbiological, radiological, chemical analysis, DNA profile and other investigative reports for medico-legal purposes.
- 6 Identify the role of anatomy, physiology, biochemistry, microbiology, pathology, blood bank, psychiatry, radiology, forensic science laboratory as well as other disciplines of medical science to logically arrive at a conclusion in medico-legal autopsies and examination of medico-legal cases.
- 7 Examine, identify, prepare reports and initiate management on medico-legal cases in emergency set up.
- 8 Plan, organize and manage toxicological laboratory services in any health care set up.

2.2 Psychomotor

- 9 Perform medico-legal examination of bones, clothing, wet specimens and weapons.
- 10 Describe relevant legal/court procedures applicable to medico-legal/medical practice.
- 11 Depose as an expert witness in a court of Law on medico-legal matters.

- 12 Collect, preserve and dispatch various samples and trace evidences to the concerned authorities in appropriate manner.
- 13 Impart education in Forensic Medicine and Toxicology to undergraduate and post-graduate students with the help of modern teaching aids.

2.3 Affective

- 14 Help and advice authorities on matters related to medical ethics and medico-legal issues.
- 15 Manage medico-legal responsibilities in mass disasters involving multiple deaths like fire, traffic accident, aircraft accident, rail accident and natural calamities.
- 16 Participate in various workshops/seminars/journal clubs/demonstration in the allied departments, to acquire various skills for collaborative research.
- 17 Describe the principles of the techniques used in toxicological laboratory namely TLC (Thin Layer Chromatography), GLC (Gas Liquid Chromatography), AAS (Atomic Absorption Spectrophotometry), HPLC (High Performance Liquid Chromatography) and Breath Alcohol Analyzer.

3. Syllabus

3.1 Theory

System/Section	List of topics
General Principles of Forensic Medicine and Toxicology	i. Identify the role of anatomy, physiology, biochemistry, microbiology, pathology, blood bank, psychiatry, radiology, forensic science laboratory as well as other disciplines of medical science to logically arrive at a conclusion in medico-legal autopsies and examination of medico-legal cases. ii. Describe the basic principles of techniques used in toxicological laboratory namely TLC, GLC, ASS, HPLC and Breath Alcohol Analyzer. iii. Execute the skills and knowledge expected at undergraduate level.
Basic Sciences and allied Subjects	Anatomy: Anatomy of parts and organs of the body which are important from the medico-legal aspect. Physiology and Biochemistry: Mechanism of phenomena those are important in the body from the medico-legal viewpoint. Pathology: Pathophysiology of vital processes and response mechanisms that modulate tissue and organ reaction to all forms of injury and have a bearing on antemortem and postmortem appearance in medico-legal cases, assessment of the duration of injuries and correlate trauma and disease. Dentistry: Adequate knowledge of dentistry for solution of medico-legal problems like, injuries, age determination and identification Radiology: Adequate knowledge of radiological procedures for solution of medico-legal problems. Fundamentals of Forensic Medicine
Medical Ethics and Law (Medical Jurisprudence)	• Describe the history of Forensic Medicine. • Describe the legal and medico-legal system in India. • Describe medical ethics and the law in relation to medical practice, declarations, oath, etiquette, Medical Council of India, disciplinary control, rights and duties of a registered medical practitioner's professional misconduct, consent, confidentiality, medical negligence (including all related issues) and Consumer Protection Act. • Describe medical ethics and law in relation to Human Organ Transplantation Act, biomedical human research and experimentation, human rights, cloning, genetic engineering, human genome, citizen's charter, International codes of medical ethics and Bombay Anatomy

	Act. • Describe the ethics and law in relation to artificial insemination, abortion, antenatal sex, foetus, genetics and euthanasia. • Interpret the ethics and law applicable to the human (clinical trials) and animal experimentation. • Describe ethics in relation to elderly, women and children. • Describe various scenarios of negligence cases and how to proceed in it.
Clinical Forensic Medicine	• Examine, assess legal implications and prepare report or certificate in cases of physical assault, suspected drunkenness, sexual offences, consummation of marriage and disputed paternity. • Collect, preserve and dispatch the specimen/material to the concerned authority and interpret the clinical and laboratory findings which are reported. • Examine injured person, prepare medico-legal report and initiate management. • Determine the age and establish identity of an individual for medico-legal purpose. • Examine a person and assess disability in industrial accidents and diseases. • Perform examination and interpret findings for medico-legal purposes in cases pertaining to pregnancy, delivery, artificial insemination, abortion, sterilization, Impotence, AIDS and infectious disease. • Describe normal and abnormal sexual behaviour and its medico-legal implications. • Examine and assess the medical fitness of a person for insurance, government service, sickness and fitness on recovery from illness. • Examine medico-legal problems related to clinical disciplines of medicine and allied subjects, Paediatrics, Surgery and allied subjects, ENT, Ophthalmology, Obstetrics and Gynaecology, Dermatology and Anaesthesiology. • Examine medico-legal problems related to children, women and elderly. • Identify the cases of torture and violation of human rights and issues thereto
Forensic Pathology	• Apply the principles involved in methods of identification of human remains by race, age, sex, religion, complexion, stature, hair, teeth, anthropometry, dactylography, footprints, hairs, tattoos, poroscopy and superimposition techniques. • Perform medico-legal postmortem and be able to exhume, collect, preserve and dispatch specimens or trace evidence to the appropriate authority. • Diagnose and describe the pathology of wounds, mechanical and regional injuries, ballistics and wound ballistics, electrical injuries, lightning, neglect and starvation, thermal injuries, deaths associated with sexual offences, pregnancy, delivery, abortion, child abuse, dysbarism and barotraumas. • Describe patho-physiology of shock and neurogenic shock. • Describe patho-physiology of asphyxia, classification, medico-legal aspects and postmortem findings of different types of asphyxial deaths. • Diagnose and classify death, identify the signs of death, Forensic Taphonomy (postmortem changes), Forensic entomology, interpret autopsy findings, artefacts and results of the other relevant investigations to logically conclude the cause, manner (suicidal, homicidal and accidental) and time of death.

	• Manage medico-legal responsibilities in mass disasters involving multiple deaths like fire, traffic accident, aircraft accident, rail accident and natural calamities. • Demonstrate postmortem findings in infant death and to differentiate amongst livebirth, still birth and dead born. • Perform postmortem examination in cases of death in custody, torture and violation of human rights. • Perform postmortem examination in cases of death due to alleged medical negligence as in operative and anaesthetic deaths. • Perform postmortem examination in cases of death due to virus affected bodies (HIV, Rabies, SARS, COVID-19) • Describe Verbal autopsy and Virtual autopsy. • Describe Humanitarian Forensic and role of Forensic Expert in Disaster management.
Toxicology	• Describe the law relating to poisons, drugs, cosmetics, narcotic drugs and psychotropic substances. • Examine and diagnose poisoning cases and apply principles of general management and organ system approach for the management of poisoning cases. • Describe the basic principles of pharmacokinetics and pharmacodynamics of poisonous substances. • Describe the toxic hazards of occupation, industry, environment and the principles of predictive toxicology. • Collect, preserve and dispatch material/s for analysis, interpret the laboratory findings and perform the Medico-legal formalities in a case of poisoning. • Demonstrate the methods of identification and analysis of common poisons. • Describe the signs, symptoms, diagnosis and management of common acute and chronic poisonings.
Forensic Psychiatry	• Explain the common terminologies of forensic importance in Psychiatry. • Describe the medico-legal aspects of Psychiatry and mental health. • Describe medico-legal aspects of drug addiction. • Describe role of Psychiatry in criminal investigation, punishment and trial. • Describe the civil and criminal responsibilities of a mentally ill person. • Describe the role of Psychology in criminal investigation, punishment and trial

3.2 Practical/ Skills (wherever applicable):

As described in theory syllabus (Integral part)

4. PG activity programme

S.No	Activity	Frequency
1.	Seminar	Once a week
2.	Journal club	Once a week
3.	Tutorial/Case presentation	Once a week
4.	Microteaching	Once a week
5.	Dissertation work	Once every 6 months

Note: The above will be in addition to routine departmental activities and undergraduate teachings (details of teaching methods may be given as annexure if applicable)

5. Rotations/postings

Rotation postings: Other than the Department of Forensic Medicine & Toxicology, student will be posted for training in the following clinical disciplines for a given period of time on rotational basis:

S.N	Department (Internal/External)	Duration & Timing			Rotation objectives
		1 st year	II nd year	III rd year	
1	Trauma & Emergency/ Casualty / Emergency medicine department	1 month	15 days	15 days	- Medicolegal case management - Basics of poisoning emergencies
2	Radiology	7 days	5 days	3 days	Psychiatric evaluation in criminal cases/civil cases
3	Psychiatry	5 days	3 days	2 days	- Basics of DNA technology - Recent advances in FSL
4	Forensic science laboratory	7 days	15 days	--	- Basics of tissue processing and staining techniques - Reporting of autopsy-based histopathology slides
5	Pathology	7 days	15 days	15 days	Basics of techniques of analytical toxicology like HPLC, GC-MS, etc.
6	Recognised Institute of Government of India/ Government of Maharashtra	--	--	7 days	- Medicolegal case management - Basics of poisoning emergencies

6. Dissertation

- I. Every candidate shall carry out work on an assigned research protocol under the guidance of a recognized Postgraduate teacher, the protocol shall be written and submitted in the form of dissertation.
- II. Every candidate shall submit Dissertation plan in form of synopsis within the given time frame.

Process has to be completed within six months of admission to MD program.

Activity	January session	July session
Selection of topic in consultation with PG guide	March/April	September/October
Approval by Department PG Committee		
Institute Scientific Committee approval	May/June	November/December
Institute Ethics Committee approval		
Final approval letter by Academic section	30 th June	31 st December
Final submission to academic section		

7. Assessment plan

7.1 Six monthly report: Time schedule for six monthly progress reports will be as follows:

Report	July Session		January Session	
	Period	Date of submission	Period	Date of submission
First	July to December	7 th January	January to June	7 th July
Second	January to June	7 th July	July to December	7 th January
Third	July to December	7 th January	January to June	7 th July
Fourth	January to June	7 th July	July to December	7 th January
Fifth	July to December	7 th January	January to June	7 th July
Sixth	January to June	10 th June	July to December	10 th December

Note- The first five reports will be taken into consideration to decide the eligibility of the student to appear for the professional examination.

7.2 List of certifiable skills

S.N.	Topics	Competency
1	Injury	Documentation and certification of trauma
2	MCCD	Diagnosis and certification of death
3	Age certificate	Certification of age estimation
4	Sexual offence examination	Certification of sexual assault survivor and accused examination
05	Autopsy report	Performing Postmortem examination and preparation of report

7.3 Formative Assessment

7.3.1 Theory

S.N.	Schedule	Marks
1.	At end of First year	100 (1 Paper)
2.	At end of Second year	100 (1 Paper)
3.	Pre-professional	400 (4 Papers of 100 marks each)
	Total	600 Marks

7.3.2 Practical

S.N.	Schedule	Marks
1.	At end of First year	100
2.	At end of Second year	100
3.	Pre-professional	400 (Practical 300 + Viva 100)
	Total	600 marks

Eligibility for Professional assessment:

- Candidate should secure a minimum of 40% marks in Theory and Practical separately in formative assessments, in order to be eligible to appear for Professional Examination
- Atleast four out of six monthly progress report should be satisfactory
- Acceptance of Dissertation is mandatory
- Successful completion of Research Methodology programme at induction
- The post graduate students would be required to present one poster presentation, to read one paper at a national/state conference and to submit one research paper for publication/ during period of their postgraduate studies.

7.4 Final Professional Assessment

A	Theory	4 Papers each of 100 marks = 400 marks
B	Practical	Practical/ Clinical Case + Viva = 400 marks

Note:

(A) Minimum 40% marks in each paper and aggregate of 50% marks in order to be declared pass in theory exam

(B) Minimum 50% marks required in Theory & Practical separately, in order to be declared successful in summative exam

8. Recommended Reading

8.1 Books

1. Subramanyam BV. Modi's Medical Jurisprudence and Toxicology. Butterworths India, New Delhi.
2. Nandy A. Principles of Forensic Medicine, New Central Book Agency Calcutta.
3. Lyon's Medical Jurisprudence for India. Delhi Law House, Delhi.
4. Reddy KSN. The Essentials of Forensic Medicine and Toxicology, K. Saguna Devi Publishers, Hyderabad.
5. Bernard Knight. Forensic Pathology. Arnold Publishers London.
6. Di Maio VJ, Di Maio D. Forensic Pathology. CRC Press New York.
7. Camps FE. Gradwohl's legal Medicine. Bristol: John Wright and Sons Ltd.
8. American College of Legal Medicine Textbook Committee. Legal Medicine Mosby Publishers, USA.
9. Di Maio VJM. Gunshot Wounds, CRC Press USA.
10. Gordon I, Shapiro HA, Berson SD. Forensic Medicine – A Guide Principle. Churchill Livingstone New York.
11. Mant AK. Taylor's Principles and Practice of Medical Jurisprudence, Churchill Livingstone, New York.
12. Parikh CK. Medicolegal Postmortems in India. Medical Publications, Bombay.
13. Gresham GA, Turner AF. Postmortem Procedure An illustrated Text Book. Wolfe Medical Publications.
14. Ludwig J. Current Methods of Autopsy Practice. WB Saunders Company, London.
15. Gordon I, Turner R. Medical Jurisprudence E and S Livingstone Ltd. London.
16. Spitz WU, Fisher RS. Medico-legal Investigation of Death. Charles Thomas Publishers.
17. Stark MM. A Physicians Guide to Clinical Forensic Medicine. Humana Press Totowa, New Jersey.

8.2 Journals

1. Forensic Science International
2. Journal of Forensic Sciences
3. Medicine, Science and Law
4. Journal of Forensic and Legal Medicine
5. American Journal of Forensic Medicine and Pathology
6. Journal of Indian Academy of Forensic Medicine
7. Journal of Clinical Forensic Medicine
8. Journal of Forensic Research
9. Journal of Forensic Radiology and Imaging
10. Medico-Legal Journal.