



UG Curriculum
Forensic Medicine & Toxicology

**DEPARTMENT OF FORENSIC MEDICINE
& TOXICOLOGY**



All India Institute of Medical Sciences (AIIMS), Nagpur

Forensic Medicine & Toxicology

Goal

The broad goal of teaching undergraduate students Forensic Medicine is to produce a physician who is well versed about Medico-legal responsibility in the practice of medicine. He/She will also be capable of making observations and inferring conclusions by logical deductions to set enquiries on the right track in criminal matters and associated medico-legal problems, in the administration of justice. He/She acquires knowledge of the law concerning medical practice, medical negligence, and respect for codes of Medical ethics.

Educational objectives

At the end of the course, the students shall be able to

- i) Know the essential Medico-legal aspects of patient management in healthcare setup.
- ii) Know the physician's responsibilities in criminal matters and respect for the codes of Medical ethics.
- iii) Identify also legal aspects of common acute and chronic poisonings.
- iv) Appreciate the medico-legal aspects and findings of post-mortem examination in cases of death due to common unnatural conditions and poisonings.
- v) Manage proper Medico-legal examination and documentation/ reporting of Injury and Age.
- vi) To examine victims or offenders of sexual offences.
- vii) To preserve relevant ancillary materials for medico-legal examination.
- viii) To identify important post-mortem findings in common unnatural deaths

Syllabus

Theory

a. Paper wise distribution

Paper I	Paper II
1. Identification 2. Medicolegal Autopsy 3. Changes in body after death 4. Mechanical Injuries 5. Regional Injuries 6. Burns & Firearm injuries 7. Asphyxial deaths 8. Sexual Jurisprudence 9. Starvation, Torture, Artefacts 10. Forensic Psychiatry	1. Legal Procedures in Medico-Legal cases 2. Medical Jurisprudence 3. Forensic Science Laboratory 4. Forensic Toxicology 5. Recent advances in Forensic Medicine

**b. Topic-wise distribution**

Sr. No.	Topic	Teaching Hours	Teaching/ Learning Method
1.	Forensic Medicine	45 hours	Didactic Lectures/ Tutorials/ Seminars/ Self Directed learning/
2.	Toxicology	20 Hrs	
3.	Legal Procedures in Medico-Legal cases	5 hours	
4.	Medical Jurisprudence	15 hours	
	Total	85 hours	

Part- I Forensic Medicine (N=45)**A) Definition, scope relevant to the subject**

- History of Forensic Medicine
- Need, scope, importance, and probative value of Medical evidence in Crime Investigation.

B) Personal identity and its importance.

- Data useful for identification of living and dead
- Age estimation and its medico-legal importance
- Sex determination and its medico-legal importance
- Other methods of establishing identity: Corpus Delicti, dactylography, tattoo marks, deformities, scars, and other relevant factors
- Identification of decomposed, mutilated bodies and skeletal remains
- The medico-legal aspect of DNA fingerprinting - a brief introduction
- The medico-legal aspect of blood and bloodstains: Collection, Preservation, and dispatch of specimen for blood and other ancillary material for identification and medico-legal examination.

C) Mechanical injuries and burns

- Definition and classification of injuries: Abrasions, Contusions, Lacerations, Incised and Stab injury, Firearm and Explosion injury, Fabricated and Defence injury.
- Medico-legal aspect of injury/hurt, simple and grievous hurts, murder, Antemortem, Postmortem Wounds, Age of the injury, cause of death, and relevant sections of I.P.C., Cr.P.C.
- Causative Weapon and appearance of Suicidal, Accidental and Homicidal injuries
- Physical methods of Torture and their identification
- Reporting on Medico-legal cases of Hurts
- Regional injuries: Head injury, cut throat injuries, and Road traffic accident injuries
- Thermal injuries: Injuries due to heat and cold, Frostbite, Burns, and Scalds.
- Injuries due to Electricity, Lightning

D) Medico-legal aspects of sex, marriage and infant death

- Sexual Offences and perversions: Natural (Rape, Adultery, and Incest), Unnatural (Sodomy, Bestiality, and Buccal coitus) Lesbianism, perversions, and relevant sections of I.P.C. and Cr.P.C. Examination protocol as per Ministry of Health & Family Welfare, Govt. of India.



2. Fertility, Impotence, Sterility, Virginity, Nullity of marriage and divorce, pregnancy, delivery, paternity, legitimacy, artificial insemination, fertilisation in vitro, sterilization (family planning measures), abortions, medical termination of pregnancy, criminal abortions, Battered Baby Syndrome, Cot deaths and relevant sections of I.P.C. and Cr.P.C., and PCPNDT
3. Infant death (Infanticide)

E) Medico-legal aspects of death

1. Definition and concept of death, stages, modes, Signs of death and its importance changes after death, Cooling, Hypostasis, Changes in the eye, Muscle changes, Putrefaction, Saponification, Mummification, Estimation of time since death
2. Death Certification, Proximate causes of death, causes of sudden deaths, Natural deaths. Presumption of death and survivorship, disposal and preservation of dead
3. Introduction to The Human organ transplantation Act and Bombay Anatomy Act.
4. Medico-legal aspects and findings of post-mortem examination in cases of death due to common unnatural conditions.
5. Sudden unexpected death, deaths from starvation, cold and heat, and their medico-legal importance.
6. Medico-legal aspects of death from Asphyxia, Hanging, Strangulation, Suffocation, and Drowning.

F) Medico-legal autopsy

1. Autopsy: Objectives, Facilities, Rules, and Basic techniques, Proforma for reporting medico-legal autopsy.
2. Exhumation, an examination of mutilated remains, Obscure autopsy and post-mortem artefacts.
3. Virtual autopsy & Verbal autopsy
4. Autopsy on virus affected body (Rabies, SARS, COVID-19)
5. Humanitarian Forensic and role of Forensic Expert in disaster management.

G) Forensic psychiatry

1. Definition, General terminology, and Basic concept of normality and abnormality of human behaviour, Civil and Criminal responsibility.
2. Examination, certification, restraint, and admission to Mental Hospital.
3. Mental Health Act – Principles and Objectives.
4. Fitness of allegedly insane person to stand trial.

Part – 2 Toxicology (N=20)

A) Poisons and their medico-legal aspects

1. Definition of poison, general consideration, and Laws concerning poisons\Narcotic drugs and psychotropic substances Act, Schedules H and L drugs, Pharmacy Act,
2. Duties and responsibilities of attending physician
3. Common poisons and their classification, identification of common poisons, Routes of administration, Actions of poisons and factors modifying them, Diagnosis of poisoning, Treatment/ Management of cases of acute and chronic poisonings
4. Addiction and Habit-forming drugs, drug dependence.
5. Occupational and environmental poisoning, prevention and Epidemiology of common poisoning and their legal aspects about Workmen's Compensation Act
6. Medico-Legal aspects and findings of post-mortem examination in cases of death due to Poisonings.

**B) Poisons to be studied**

1. Corrosive: Euphoric Acid, Nitric Acid, Hydrochloric Acid, Carbolic Acid, and Oxalic Acid, Non-metallic, Metallic Poisons- compounds of Lead, Arsenic, Mercury, and Copper.
2. Plant Poisons: Castor, Croton, Capsicum, Semicarpus Anacardium (Bhilawa), Calatropis Gigantea, Abrus Precatorius (Ratti), Dhatura, Cannabis Indica, Cocaine, Opium, Aconite, Yellow Oleander, Strychnine
3. Animal and Bacterial Poisons: Snakes, Scorpion and Food poisoning
4. Alcohol (Drunkenness) Ethyl Alcohol, Methyl Alcohol, Kerosene, Barbiturates
5. Asphyxiant & Gaseous Poisons: CO, War gases, HCN, and Cyanides
6. Insecticides and pesticides: Organo-Phosphorus Compounds, Organo-Chloro Compounds, Carbamates (Carbaryl) and Rodenticides (Phosphides)

C) Forensic Science Laboratory

1. Aims, objects, general knowledge about Forensic Science Laboratory.
2. General principles of analytical toxicology.
3. Lie detection techniques and DNA fingerprinting.
4. Crime scene investigation.

Part – 3 Medical Jurisprudence: (N=15)**A) Legal and ethical aspects of the practice of medicine**

1. Rights and obligations of Registered Medical Practitioners and patient, Duties of physicians and patients, Euthanasia
2. Infamous conduct, Professional secrecy, and privileged communications
3. Codes of Medical Ethics, medical etiquette, Medical Negligence, and contributory negligence, Precautionary measures, and defences for Medical Practitioners against legal actions, Medical/Doctors indemnity insurance, Consumer Protection Act relevant to medical practice
4. Medical Ethics and the prohibition of Torture & care of Torture Victims.

B) Definition of health and items to certify about health

1. Common medico-legal problems in Hospital practice, Consent in Medical Examination and treatment, under treatment/ Sickness and Fitness certificate, maintenance of medical records.
2. Social, Medical, Legal, and Ethical problems in relation to AIDS.

C) Acts and schemes related to the medical profession

Workmen's Compensation Act, the National Human Rights Commission, Human Organ Transplantation Act, and other relevant sections of I.P.C., Cr.P.C., and I.E.A.

Part – 4 Legal procedures in medico-legal cases: (N=5)

1. Medico-Legal Investigations of death in suspicious circumstances, Inquest
2. Types of Criminal courts and their powers, punishments prescribed by law, kinds of witnesses, Evidence, Documentary Medical evidence, Dying declaration.
3. The Trial of criminal cases, Rules, and Conventions to be followed by Medical witness at Medical evidence, subpoena, conduct money
4. Relevant Sections from the Indian Evidence Act, IPC, and CrPC.

**Syllabus: Practical**

Total Teaching Hours	Teaching/ Learning Method
40	Demonstration/ DOAS/ OSPE/ Role play

Part 1 Report on

1. Estimation/Certification of Age
2. Recording of fingerprints
3. Examination/Certification of the Injured [Prescribed Forms]
4. Examination of the Causative Agents in cases of Injuries (e.g., Weapons, Instruments)
 - a. Hard and blunt weapons
 - b. Sharp cutting, sharp-pointed, and Sharp Heavy cutting weapons
 - c. Firearm weapons
5. Sexual offences :
 - a. Examination/Certification of Victim
 - b. Examination/Certification of Accused
6. Examination of Foetus to opine about age
7. Examination of Bones and teeth for Medico-legal purpose to determine age, sex, stature, cause of death, time since death
8. Medical certification of cause of death as per the Birth and Death Registration Act.
9. Studies of X-rays for estimation of age, bony injury, foreign body, and pregnancy.
10. Photograph of different events of Medico-legal importance and post- mortem changes.
11. Study of various museum specimens of medico-legal significance
12. Study of various slides of medico-legal significance

Part 2 Forensic Toxicology

1. Examination/certification of drunkenness
2. Study of Common poisons: [Sulphuric Acid, Nitric Acid, Hydrochloric Acid, Carbolic Acid, and Oxalic Acid, Phosphorous, Lead, Arsenic, Mercury, Copper, Castor, Croton, Capsicum, Semicarpus Anacardium (Bhilawa), Calatropis Gigantea, Abrus Precatorius (Ratti), Dhatura, Cannabis Indica, Opium, Aconite, Yellow Oleander, Strychnine, Snakes, Scorpion, Alcohol, Methyl Alcohol, Kerosene, Barbiturates, Organophosphorus compounds, Organochloro compounds, Carbamates (Carbaryl) and commonly used poisons, antidotes, and preservatives.

Part 3 Medical Jurisprudence

1. Study of Medical Certificates [Prescribed Forms]
 - a. Sickness Certificate
 - b. Fitness Certificate
 - c. Certificate of Physical fitness
2. Moot court activity

Part – 4 Legal procedures in medico-legal cases

1. Study of the various prescribed Forms: Consent to surgery Anaesthesia and other medical services, post-mortem form, pictorial post- mortem form, forms for despatch of exhibits other than the viscera to the chemical analyser, forms for despatch of viscera for histopathological examination, form for despatch of viscera to the chemical analyser, Forensic Science Laboratory report form, Summons to witness.

**Annexure A****Examination pattern & marks distribution of 2nd MBBS**

INTERNAL ASSESSMENT	Theory	Practical
3 rd IA exam (Third Semester)	50	50
4 th IA exam(Fourth Semester)	50	50
Total	100	100
Out of	50	50
Pre-professional exam	Paper I:50 Paper II:50	100
Total	100	100
Out of	50	50
Total for IA	100	100
Professional exam	Paper I:50 Paper II:50	100
Total	100	100
Grand Total	200	200

Eligibility for appearing in Professional exam: at least 50 % marks in theory and 50% marks in practical each.

Passing criteria: Minimum 50 % marks in theory & Practical each

Theory paper duration: for 50 marks: 2hrs 30mins

Theory & Practical Examination pattern for 2nd MBBS

3 rd IA exam (Third Sem) & 4 th IA exam(Fourth Sem)	Theory pattern (50 Marks)	20MCQs (0.5x20 =10marks); 6 SAQ (6x2=12 marks); 3 BAQ (4x3 =12 marks); 2 structured LAQs (8 x2=16marks)
	Practical Pattern (50 marks)	Spotting OSPE(10) Exercises • 2 Short exercise (2x5) • 2 Long exercise (2x10). Viva voce : (10)
Pre-professional exam & Professional exam	Theory	20MCQs (0.5x20 =10marks); 6 SAQ (6x2=12 marks); 3 BAQ (4x3 =12 marks); 2 structured LAQs (8 x2=16marks)
	Practical(100 marks)	Spotting OSPE (20) Exercises • 2 Short exercise (2x10) • 2 Long exercise (2x20). Viva voce : (20)

**Theory Classes**

Sr No	Theory Topic	No. of teaching hours
Topic to be covered in 1st semester		
1.	Introduction to Forensic Medicine	1
2.	Legal Procedure	4
3.	Medical law and Ethics	5
4.	Identification	4
5.	Postmortem changes	4
6.	Mechanical Injuries	5
7.	Regional Injuries	4
8.	Thermal Deaths	2
Total		29
Tutorial		
9.	Death & Its Cause	2
10.	Medicolegal Autopsy	3
11.	Medicolegal aspects of wounds	2
Total		7
Topic to be covered in 2nd semester		
12.	Starvation	1
13.	Mechanical Asphyxia	4
14.	Anaesthetic and Operative deaths	1
15.	Impotence and sterility	1
16.	Virginity, Pregnancy & Delivery	2
17.	Abortion	1
18.	Sexual offences	3
19.	Infant Deaths	1
20.	Bloodstains	2



21.	Artefacts	1
22.	Forensic psychiatry	2
Total		19
Tutorial		
23.	Forensic Science laboratory	1
24.	General considerations Toxicology	3
Total		4
Topic to be covered in 3rd semester		
25.	Agricultural poisons	1
26.	Corrosive Poisons	2
27.	Metallic Poisons	2
28.	Inorganic Irritant Poisons	1
29.	Organic Irritant Poisons	2
30.	CNS Depressants	2
31.	Psychotropic Drugs	1
32.	Deliriant poisons	1
33.	Drug Dependence & Abuse	1
34.	Spinal poisons	1
35.	Cardiac poisons	1
36.	Asphyxiants	1
37.	Miscellaneous poisons	1
38.	Food Poisoning	1
39.	Analytical Toxicology	1
Total		19
Tutorial		
40.	Various acts & Family health survey	1
41.	Public communication, research & ethics	1
Total		2
Total	Theory	67
	Tutorial	13
	SDL	5
Total teaching hours		85

**Practical Classes**

Sr No	Practical work	Teaching Hours
Topics to be covered in 1st Semester		
1.	Examination bones and teeth for the medico-legal purpose	1
2.	Examination/Certification of the injured	2
3.	Examination of weapons in cases of injuries	2
4.	Determination of Age / X – Ray examination	1
5.	Examination of the foetus to opine about age	1
6.	Examination/Certification of Accused of Sexual offences	1
7.	Examination/Certification of Victim of sexual offences	1
8.	Medical Certification of Cause of Death (MCCD)	1
9.	Study of Photographs of Medico-legal importance	1
10.	Study of the museum specimens of Medico legal significance	1
11.	Study of various slides of Medico legal significance	1
12.	Examination of Blood	1
Total		14
Topics to be covered in 2nd Semester		
13.	Examination of Semen	1
14.	Examination of Hair	1
15.	Sickness Certificate	1
16.	Fitness Certificate	1
17.	Examination /Certification of Drunkenness	1
18.	Study of common poisons	1
19.	Study of common antidotes and preservatives	1
20.	Requisition for Post mortem examination	1



21.	Medico-legal Autopsy no. 1	1
22.	Medico-legal Autopsy no. 2	1
23.	Medico-legal Autopsy no. 3	1
24.	Medico-legal Autopsy no. 4	1
25.	Medico-legal Autopsy no. 5	1
Total		13
Topics to be covered in 3rd Semester		
26.	Medico-legal Autopsy no. 6	1
27.	Medico-legal Autopsy no. 7	1
28.	Medico-legal Autopsy no. 8	1
29.	Medico-legal Autopsy no. 9	1
30.	Medico-legal Autopsy no. 10	1
31.	Model post mortem report from (NHRC)	1
32.	Labels for the Viscera bottles	1
33.	Forms for dispatch of viscera to the chemical analyzer	1
34.	Forms for dispatch of exhibits other than the viscera to C.A.	1
35.	Forms for dispatch of organs /tissues for Histopathological Examination	1
36.	Summon to witness	1
37.	Medico-legal case information form	1
38.	Expert Opinion	1
Total		13
Total teaching hours		40

**Recommended Textbooks**

1. Justice Kannan. BV. Modi's Medical Jurisprudence and Toxicology. Butterworths India, New Delhi.
2. Nandy A. Principles of Forensic Medicine, New Central Book Agency Calcutta.
3. Reddy KSN, Murthy OP. The Essentials of Forensic Medicine and Toxicology, K. Jaypee Publishers, New Delhi.
4. Parikh CK. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology, CBS Publishers and Distributors, New Delhi.
5. Bernard Knight. Forensic Pathology. Arnold Publishers London.
6. Patnaik VP. MKR Krishnan's handbook of Forensic Medicine. Paras Publishing.
7. Krishan Vij. Textbook of Forensic Medicine and Toxicology, Churchill Livingstone.
8. Pillay VV. Textbook of Forensic Medicine and Toxicology, Paras Publishing, Hyderabad.
9. Mukherjee JB. Textbook of Forensic Medicine and Toxicology, Arnold's Publishers, London.
10. Rajesh Bardale. Principle of Forensic Medicine & Toxicology. Jaypee Brothers, New Delhi
11. Anil Aggrawal. Textbook of Forensic Medicine & Toxicology. Avichal publishing company, New Delhi
12. OP Murty. Colour Atlas of Medicolegal Postmortem and Forensic Pathology. CBC Publishers and Distributors Pvt Ltd, New Delhi.

Reference books

1. Lyon's Medical Jurisprudence for India. Delhi Law House, Delhi.
2. Ludwig J. Current Methods of Autopsy Practice. WB Saunders Company, London.
3. Bernard Knight. Simpson's Forensic Medicine. Arnold Publishers London.
4. Bernard Knight. Legal aspects of Medical Practice. Churchill Livingstone, New York.
5. Mehta HS. Medical, Law, and Ethics in India. The Bombay Samachar Pvt. Ltd.
6. Di Maio VJ, Di Maio D. Forensic Pathology. CRC Press New York.
7. American College of Legal Medicine Textbook Committee. Legal Medicine Mosby Publishers, USA.
8. Di Maio VJM. Gunshot Wounds, CRC Press USA.
9. Spitz WU, Fisher RS. Medicolegal Investigation of Death. Charles Thomas Publishers
10. Stark MM. A Physicians Guide to Clinical Forensic Medicine. Humana Press Totowa, New Jersey.
11. Mason JK. Paediatric Forensic Medicine and Pathology. Chapman and Hall, London.
12. Polson, Gee, Knight. The Essentials of Forensic Medicine. Pergomann Press, UK.
13. Simpson K. Taylor's Principle and Practice of Medical Jurisprudence. Vol. I-II.