



FORENSIC MEDICINE AND TOXICOLOGY — M D

PROGRAMME GOALS

This programme aims at training a competent expert in Forensic Medicine and Medical Toxicology.

PROGRAMME OBJECTIVES

This programme aims at training an expert in Forensic Medicine & Medical Toxicology who at the end of the training will be able to:

1. Identify and define the existing as well as future Medico-legal problems as they emerge in the community and work to resolve such problems by planning, implementing, evaluating and modulating Medico-legal services.
2. Undertake Medico-legal responsibilities and discharge Medico-legal duties, which arise in day-to-day general practice as well as in hospitals.
3. Keep himself/herself abreast with all recent developments and emerging trends in the field of Medical Ethics and the Law.
4. Evaluate his professional activities, educational needs and select appropriate learning resources periodically.
5. Deal with general principles and practical problems related to forensic, clinical, emergency, environmental, medico-legal and occupational aspects of Toxicology.
6. Impart education in Forensic Medicine and Toxicology to under-graduate and post-graduate students with the help of modern teaching aids.

STUDENT ELIGIBILITY CRITERIA AND SELECTION METHOD

1. Medical Graduates with MBBS or equivalent medical degree from a recognized University in India after the completion of their internship and who are registered with the Indian Medical Council are eligible to apply.
2. Selection of students will be as per the existing regulations of the All India Institute of Medical Sciences, New Delhi.

SPECIFIC OBJECTIVES

At the end of the MD course, a post-graduate student should be able to:

1. Perform Medico-legal autopsy independently with required physical assistance, prepare report and derive inferences.
2. Interpret histo-pathological, microbiological, radiological, chemical analysis, DNA analysis and other investigative reports for Medico-legal purposes.
3. Depose as an expert witness in a Court of Law on Medico-legal matters.
4. Describe relevant legal/court procedures applicable to Medico-legal/medical practice.
5. Identify, examine and prepare reports on Medico-legal cases.
6. Identify and discharge all legal responsibilities in Medico-legal matters.
7. Plan, Organise and supervise Medico-legal work in general/teaching hospitals.
8. Interpret, analyse & review Medico-legal reports prepared by other Medical Officers.
9. Collect, preserve and despatch various trace evidences to the concerned authority.
10. Identify and articulate medical ethics in relation to the patient, profession, society, state and humanity at large.
11. Interpret and advice authorities on matters related to Medical Ethics and the Law.
12. Discharge his duties in respect of forensic, clinical, emergency, environmental, medico-legal and occupational aspects of Toxicology.
13. Plan, Organise and manage Toxicological Laboratory services.
14. Provide information and consultation on all aspects of toxicology to professionals, industry, Government and public at large.

CONCEPTUAL FRAMEWORK

TIMES IN YEARS



3	UNIT 2	ORGANISED	FINAL ASSESSMENT
		T	
2½	POSTING FOR	E	
	• AUTOPSY WORK	A	SUBMISSION
	• CLINICAL FORENSIC MEDICINE	C	OF THESIS
	• ALL ASPECTS OF TOXICOLOGY (COLLECTION, PRESERVATION,	H	
2	TRANSPORTATION, ANALYSIS	I	
	OF BIOLOGICAL SAMPLES)	N	
		G	
1½	• DNA FINGER-PRINTING		T
	• RESEARCH, ANALYSIS AND	S	H
	PRESENTATION OF DATA	E	E
	• MEDICO-LEGAL WORK IN	S	S
	CASUALTY DEPT	S	I
	• TOXICOLOGY LAB WORK	I	S
	• ATTEND COURT SUMMONS	O	
		N	
		S	
1	UNIT 1	AND	
	• CLINICAL FORENSIC MEDICINE	S	
	• ORIENTATION TO BASIC	E	
	MEDICAL SCIENCES.	M	
	• AUTOPSY WORK	I	
	• ATTEND COURT SUMMONS	N	
		A	
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		S	
½	UNIT 0		CONTINUOUS GUIDANCE
	• INTRODUCTION TO GENERAL PRINCIPLE OF FORENSIC MEDICINE & TOXICOLOGY,		THESIS
	• DEVELOPMENT OF BASIC AUTOPSY SKILLS		PROTOCOL
	• THESIS-TOPIC SELECTION		SUBMISSION
0			
	• DOCUMENTATION		
	• JOINING FORMALITIES		

MODULE

UNIT 0 (UPTO 6 MONTHS)

- A.
 - 1. Orientation Programme
 - 2. Basic autopsy skills.
 - 3. General Principles of Forensic Medicine.
 - 4. Introduction to Medical Toxicology.
- B. Organised Teaching Session.
 - 1. Attend and participate in undergraduate classes.
- C. Posting for autopsy work, Clinical Forensic Medicine and Toxicology
- D. Orientation to Organisation and functioning of Toxicology Lab.
- E. Preparation of Thesis protocol.
- F. Introduction to advanced techniques – DNA Fingerprinting.

UNIT 1 (6 – 12 MONTHS)

- A. Clinical Forensic Medicine work for practical experience in Medico legal procedures and on the job practical training in the Medico-legal aspects of emergency medicine, radiology and other clinical disciplines.
- B. Orientation to the applied aspects of Anatomy, Physiology Biochemistry, Microbiology, Pathology, Blood Bank, Psychiatry and Central Forensic Science Laboratory.
- C. Organized teaching session.
 - 1. Undergraduate classes (Attend & participate)
 - 2. Journal review/Review of latest advances - once a fortnight
 - 3. Autopsy case discussion & Gross Autopsy Conference - once a fortnight
 - 4. Clinical forensic medicine case discussion - once a fortnight
 - 5. Seminars - once a week
 - 6. Toxicology conference - once in a month
- D. Thesis Work and other research work.
- E. Posting for Autopsy work, Clinical Forensic Medicine and Toxicology Laboratory.
- F. Attend Court summons for cases conducted by themselves or when deputed where an expert is required to depose by Court of Law.

UNIT 2 (12-36 MONTHS)

- A. Organized teaching session.
 - 1. Attend and participate in undergraduate classes.
 - 2. Journal review - once a fortnight
 - 3. Autopsy case discussion - once a fortnight
 - 4. Clinical forensic medicine case discussion - once a fortnight

- 5. Seminars - once a fortnight
- 6. Toxicology conference - once in a month
- B. Submission of Thesis six months prior to examination.
- C. Posting for autopsy work, clinical Forensic Medicine and Toxicology laboratory to continue.
- D. Attend court summons for cases conducted by themselves or when deputed where an expert is required to depose by Court of Law.

SUBJECT CONTENT

I. ORIENTATION PROGRAMME

- A. Familiarisation with the philosophy and guiding principles of MD Forensic Medicine and Toxicology course at AIIMS.
- B. Identify the programme goals, specific objectives and conceptual framework for his/ her course.

II. BASIC AUTOPSY SKILLS

- A. Outline & demonstrate the principles and objectives of postmortem examination, formalities and procedures of medico-legal autopsies in accordance with existing conventions and the law.
- B. Describe and demonstrate the methods of preservation of viscera.

III. General principle of Forensic Medicine and Toxicology

- A. Identify the role of anatomy, physiology, biochemistry, microbiology, pathology, blood bank, psychiatry, radiology, forensic science laboratory and other disciplines of medical science to logically conclude in Medico-legal autopsies and examination of Medico-legal cases.
- B. Describe the basic principles of the techniques used in toxicological laboratory namely TLC, GLC, ASS, HPLC, and Breath Alcohol Analyzer.
- C. Process biological samples for DNA fingerprinting.
- D. Execute the skills and knowledge mentioned in objectives of Forensic Medicine for MBBS course at AIIMS.

IV. MEDICAL ETHICS & LAW (MEDICAL JURISPRUDENCE)

- A. Describe the history of Forensic Medicine
- B. Describe the Legal and Medico-legal system in India.
- C. Describe medical ethics and the law in relation to medical practice, various declarations, Medical Council of India, disciplinary control, duties of a registered medical practitioner, consent, confidentiality, medical negligence and consumer protection act.
- D. Describe medical ethics and law in relation to organ transplantation, biomedical human research and experimentation, human rights and citizen charter.
- E. Describe the ethics and law in relation to artificial insemination, abortion, antenatal sex, fetus, genetics, and euthanasia.
- F. Interpret the ethics and law applicable to the animal experimentation.
- G. Describe ethics in relation to aged, women and children.
- H. Describe medical ethics and law in relation to nursing and other medical services.

V. CLINICAL FORENSIC MEDICINE

- A. 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 & despatch the specimen/material to the concerned authority and interpret the clinical and laboratory findings which are reported.
- B. Examine injured person, prepare Medico-legal report and initiate management.
- C. Determine the age of a person for medico-legal purpose.
- D. Examine a person and assess disability in industrial accidents and diseases.
- E. Perform examination and interpret findings for medico legal purposes in cases pertaining to pregnancy, delivery, artificial insemination, abortion, sterilization, impotence & AIDS.
- F. Describe normal and abnormal sexual behaviour and its medico-legal implications.
- G. Examine and assess the medical fitness of a person for insurance, government service, sickness and fitness on recovery from illness.
- H. Examine medico-legal problems related to clinical disciplines of Medicine & allied subjects, Paediatrics, Surgery & allied subjects, ENT, Ophthalmology, Obstetrics & Gynaecology, Dermatology and Anesthesiology.

VI. FORENSIC PSYCHIATRY

- A. Explain the common terminologies of Forensic importance in Psychiatry.
- B. Describe the Medico-legal aspects of Psychiatry and mental health.
- C. Describe medico-legal aspects of Drug addiction.
- D. Describe role of Psychiatry in crime investigation, punishment and trial.
- E. Describe the civil and criminal responsibilities of an insane person.

VII. MEDICAL TOXICOLOGY

- A. Describe the law relating to poisons, drugs, cosmetics, narcotic drugs and psychotropic substances.
- B. Examine & diagnose the poisoning cases and apply principles of general management and organ system approach for the management of poisoning cases.
- C. Describe the basic principles of toxicokinetics and toxicodynamics of poisonous substances.
- D. Describe the toxic hazards of occupation, industry, environment and the principles of Predictive Toxicology.
- E. Collect, preserve and despatch the material for analysis, interpret the laboratory findings and perform the Medico-legal formalities in a case of poisoning.
- F. Demonstrate the functioning of TLC, GLC, HPLC, ASS and Spectro-photometer.
- G. Demonstrate the methods of identification and analysis of common poisons prevalent in this region.
- H. Describe the signs, symptoms, diagnosis and management of common acute and Chronic poisoning due to –
 - (a) Corrosives
 - (b) Nonmetallic Substances
 - (c) Insecticides and Weed Killers

- (d) Metallic Substances
- (e) Vegetable and Organic irritants
- (f) Somniferous Compounds
- (g) Inebriant substances
- (h) Deliriant Substances
- (i) Food contamination/adulteration..
- (j) Substance causing Spinal and cardiac toxicity
- (k) Substances causing Asphyxia (Asphyxiants)
- (l) Household toxins
- (m) Toxic envenomation
- (n) Biological and Chemical warfare.

VIII. FORENSIC PATHOLOGY

- A. Apply the principles involved in methods of identification of human remains by race, age, sex, religion, complexion, stature, hair, teeth, anthropometry, dactylography, foot prints, hairs, tattoos, poroscopy and superimposition techniques.
- B. Perform medico-legal postmortem and be able to exhume, collect, preserve and despatch specimens or trace evidence to the appropriate authority.
- C. Diagnose and describe the pathology of wounds, mechanical and regional injuries, ballistics and wound ballistics, electrical injuries, neglect and starvation, thermal injuries, deaths associated with sexual offences, pregnancy, delivery, abortion, child abuse, dysbarism and barotraumas.
- D. Describe patho-physiology of shock & neurogenic shock.
- E. Describe the patho-physiology of asphyxia, classification, medico legal aspects and postmortem findings of different types of asphyxial deaths.
- F. Diagnose and classify death, identify the signs of death, postmortem changes, interpret the autopsy findings, artefacts and results of the other relevant investigations to logically conclude the cause, manner (suicidal, homicidal and accidental) and time of death.
- G. Manage medico-legal responsibilities in mass disasters involving multiple deaths like fire, traffic accident, aircraft accident., rail accident and natural calamities.
- H. Demonstrate postmortem findings in infant death to differentiate amongst live birth, still birth and dead born.
- I. Perform postmortem examination in cases of death in custody, torture and violation of human rights.
- J. Perform postmortem examination in cases of death due to alleged medical negligence as in Operative and Anaesthetic Deaths.

IX. FUNDAMENTALS OF FORENSIC SCIENCES

- A. Describe the general forensic principle of ballistics, serology, analytical toxicology and photography.
- B. Interpret the scene of crime.
- C. Examine – bloodstains for blood grouping, seminal stains & hair for medico-legal purpose.

X. Basic Sciences and Allied Subjects

- A. Anatomy- Anatomy of parts and organs of the body which are important from the medico-legal aspect.
- B. Physiology & Biochemistry- Mechanism of phenomenon that are important in the body from the medico legal viewpoint.
- C. Pathology- Pathophysiology of vital processes and response mechanisms that modulate tissue and organ reaction to all forms of injury and have a bearing on ante mortem and postmortem appearance in Medico legal cases, assessment of the duration of injuries and co-relate trauma and disease.
- D. Dentistry- Adequate knowledge of dentistry for solution of Medico legal problems like age determination.
- E. Radiology- Adequate knowledge of Radiological procedures for solution of medico legal problems.

TEACHING – LEARNING EXPERIENCES

- A. Undergraduate classes
- B. Posting for
 - 1. Autopsy work
 - 2. Clinical Forensic Medicine
 - 3. Clinical toxicology
 - 4. Allied subjects
- C. Journal review
- D. Autopsy Case Discussion
- E. Clinical Forensic Medicine Case Discussion
- F. Seminar on Clinical & Autopsy case problems
- G. Problem solving discussion on cases for expert opinion.

THESIS FOR FORENSIC MEDICINE & TOXICOLOGY**Objectives**

- 1. The student should be able to demonstrate capability in research by planning and conducting systematic scientific inquiry & data analysis and deriving conclusion.
- 2. Communicate scientific information for health planning.

Guide for Thesis

- 1. Chief guide should be from the Department of Forensic Medicine & Toxicology.
- 2. Co-guide(s) can be from other disciplines related to the thesis.

Submission of Thesis Protocol

It should be submitted within four months after admission in the course.

- 1. Protocol in essence should consist of:
 - (a) Introduction and objectives of the research project.
 - (b) Brief review of literature.

- (c) Suggested materials and methods, and
- (d) Bibliography
- 2. The protocol must be presented in the Department of Forensic Medicine & Toxicology before being forwarded to the office of the Dean.
- 3. Protocol will be approved in accordance with the existing regulations of the AIIMS, New Delhi.

Submission of Thesis

- 1. Thesis will be submitted six months prior to examination.
- 2. Thesis in essence should consist of
 - (a) Introduction
 - (b) Review of literature
 - (c) Aims and objectives
 - (d) Material and methods
 - (e) Results
 - (f) Discussion
 - (g) Summary and Conclusions
 - (h) Bibliography

Evaluation of Thesis

Thesis will be evaluated in accordance with the existing regulations of the AIIMS, New Delhi.

ASSESSMENT

Assessment of candidates on completion of MD course will be carried out in accordance with the existing rules and regulations of the AIIMS, New Delhi.

All candidates will be examined and evaluated under the following Heads:

- Theory - Will consist of four papers as under:
- Paper I - Basic Sciences and allied subjects as applicable to Forensic Medicine & Toxicology.
- Paper II - Clinical Forensic Medicine, Forensic Psychiatry and Medical ethics & law (Medical jurisprudence).
- Paper III - Forensic Pathology & Medical Toxicology.
- Paper IV - Applied aspects of clinical disciplines, Forensic Sciences and recent advances in Forensic Medicine and Toxicology.

Practical Examination (Two days)

Day 1

- **Thesis Presentation** - For assessment of research capability.
- **Presentation of a Topic (Seminar)** - To evaluate teaching ability.
- **Clinical Cases** - (Any 4) Age estimation, Injury report, Examination of an insane person to evaluate criminal/civil responsibility, Examination of an intoxicated person, Examination of a suspected case of poisoning (Acute/ Chronic), Disputed paternity case, Sexual offences.

- **Spots** - (10) Histopathology slides, Photographs, ligature material, X-Rays, Soft tissue specimens, Bones, Poisons and Weapons.
- **Toxicology Exercises** - (Any 4) TLC, GLC, HPLC, AAS, Spectrophotometer and Electrophoresis.
- **Spot tests** - For common poisons and identification of stains (Semen, Blood, Saliva)

Day 2

- Postmortem Examination.
- Expert Second Opinion.
- Grand Viva Voce.