

**Pravara Institute of Medical Sciences  
(Deemed University)**

Loni Bk - 413 736, Tal. Rahata, Dist. Ahamadanagar (M.S.)

Established Under Section 3 of UGC Act 1956, Vide Govt. of India Notification  
No. F.9-11/2000-U.3, dated 29<sup>th</sup> September, 2003



**Syllabus**  
**M.D. (Forensic Medicine & Toxicology)**

**mail:**[registrar@pmtpims.org](mailto:registrar@pmtpims.org), [asst.registrar@pmtpims.org](mailto:asst.registrar@pmtpims.org)  
**Fax:** +91-2422-273413 **Phone No.:** 273600  
**Homepage :** [http:// pravara.com](http://pravara.com)

# **PRAVARA INSTITUTE OF MEDICAL SCIENCES**

## **Medical Faculty**

### **SYLLABUS FOR MD FORENSIC MEDICINE AND TOXICOLOGY**

**Course: MD Forensic Medicine & Toxicology**

**Duration of Course: 3 years**

#### **GOAL**

The main goal of this programme is train a competent expert in Forensic Medicine and Toxicology.

#### **PROGRAMME OBJECTIVES**

##### **Knowledge:**

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

- 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.
- Undertake Medico-legal responsibilities and discharge Medico-legal duties, which arise in day-to-day general practice as well as in hospitals.
- Keep himself/herself abreast with all recent developments and emerging trends in the field of Medical Ethics and its related Law.
- Deal with general principles and practical problems related to forensic, clinical, emergency, environmental, medico-legal and occupational aspects of Toxicology.
- Impart teaching and training in Forensic Medicine and Toxicology to under-graduate and post-graduate students with the help of modern teaching aids.

## **Skills**

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

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

## **COURSE CONTENTS**

### **PAPER - I: Basic Medical sciences and allied subjects as applicable to forensic medicine and toxicology**

#### **ANATOMY :**

- Applied aspects in relation to Forensic Medicine
- Brain and Cerebral Circulation
- Heart and Coronary Circulation
- Foetal Circulation
- Surface landmark
- Comparative anatomical study of Male and Female skeleton
- Forensic Dentistry

#### **PHYSIOLOGY:**

- Applied aspects in relation to Forensic Medicine
- Physiology of Thermoregulation
- Physiology of Shock
- Blood grouping and Rh Incompatibility
- Out line of the Functions of Circulation and Digestive system
- Physiology of Sexual function in Males and Females

#### **BIOCHEMISTRY:**

- Applied aspects in relation to Forensic Medicine
- Post-mortem Chemistry of Blood and other body fluids and their Forensic aspects

#### **GENERAL PATHOLOGY:**

- Ischaemia
- Infarction
- Thrombosis
- Embolism
- Wound healing
- Pathology of scar
- Pathology Gross & Histopathological finding in case of sudden death

## MICROBIOLOGY:

- Applied aspects in relation to Forensic Medicine
- Principles of immune-serological tests
- Precipitin test
- Pregnancy test
- Anaphylaxis and Hypersensitivity
- Wound infection
- Entomology of Cadaver

## PHARMACOLOGY:

- Applied aspects in relation to Forensic Medicine
- Pharmacology of addictive drugs and their effects
- Drugs used to procure abortion
- Drugs causing impotency
- Anaesthetic drugs and their forensic aspects
- Pharmacoproducs inducing anaphylactic and hypersensitivity reactions

## **PAPER –II: Clinical forensic medicine, forensic psychiatry, medical ethics and law (medical jurisprudence)**

### 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 & despatch 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 of a person 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.
- 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 & allied subjects,
- Pediatrics', Surgery & allied subjects, ENT, Ophthalmology, Obstetrics & Gynecology,
- Dermatology and Anesthesiology.
- CHILD ABUSE
  - Scope of Child Abuse in India
  - Diagnosis and medicolegal evaluation of child abuse
  - Autopsy protocol in cases of death due to child abuse
- VIOLENCE AGAINST WOMEN
  - Scope of Violence against women in India
  - Diagnosis and medicolegal evaluation of violence against women
  - Autopsy protocol in cases of death due violence against women
  - Laws related to Violence against Women
- THE PROTECTION OF CHILDREN FROM SEXUAL OFFENCE ACT, 2012
  - An overview of the act with its provisions & guidelines in child of sexual offence cases
  - Examination protocol in cases of child of sexual offence

### MEDICAL ETHICS & 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, various declarations, Medical Council of India, disciplinary control, duties of a registered medical practitioner, consent, confidentiality, medical negligence and consumer protection act.
- Describe medical ethics and law in relation to organ transplantation, biomedical human research and experimentation, human rights and citizen charter.

- Describe the ethics and law in relation to artificial insemination, abortion, antenatal sex, fetus, genetics, and euthanasia.
- Interpret the ethics and law applicable to the animal experimentation.
- Describe ethics in relation to aged, women and children.
- Describe medical ethics and law in relation to nursing and other medical services.
- Bio medical waste management
- Right to information Act
- AIDS – ethical, legal and social aspects
- PNMT ACT
- Consumer protection Act
- Anatomy Act
- Human organ transplantation
- Medicare Service Person & Medicare Service Institution (prevention of Violence and damage or loss to Property), Act.

### FORENSIC PSYCHIATRY

- Rules regarding admission, treatment and discharge of mentally ill person to the mental hospitals, feigned insanity, juvenile diligence in the juvenile court, restraint of mentally ill person.
- Mental health Act 1987.
- 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 crime investigation, punishment and trial.
- Describe the civil and criminal responsibilities of an insane person.

## **PAPER –III: Forensic pathology, Toxicology, Anthropology**

### **FORENSIC PATHOLOGY**

- Apply the principals involved in methods of identification of human remains by race, age, sex, religion, complexion, stature, hair, teeth, anthropometrics, Dactylography, foot prints, hairs, tattoo poroscopy and superimposition techniques.
- Perform medico-legal postmortem and be able to exhume, collect, preserve and dispatch specimen or trace evidence to the appropriate authority.
- Diagnose and describe the pathology of wounds, mechanical and regional injuries, and ballistics and wound ballistics, electrical injuries, neglect and starvation thermal injuries, deaths associate with sexual offences, pregnancy, delivery, abortion, child abuse, dysbarism and barotraumas.
- Describe patho-physiology of shock & neurogenic shock.
- Describe the 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, 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.
- 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 to differentiate amongst live birth, 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.
- Forensic Photography

### **FORENSIC TOXICOLOGY**



- Describe the law relating to poisons, drugs, cosmetics, narcotic drugs and psychotropic substances.
- Examine & diagnose the poisoning cases and apply principles of general management and organ system approach for the management of poisoning cases.
- Describe the basic principles of toxic kinetics and toxic dynamics of poisonous substances.
- Describe the toxic hazards of occupation, industry, environment and the principles of Predictive Toxicology.
- Collect, preserve and dispatch the material for analysis, interpret the laboratory findings and perform the Medico-legal formalities in a case of poisoning.
- Demonstrate the functioning of TLC, GLC, HPLC, ASS and Spectro-photometer.
- Demonstrate the methods of identification and analysis of common poisons prevalent in this region.
- Describe the signs, symptoms, diagnosis and management of common acute and chronic poisoning due to –
  - Corrosives
  - Nonmetallic Substances
  - Insecticides and Weed Killers
  - Metallic Substances
  - Vegetable and Organic irritants
  - Somniferous Compounds
  - Inebriant substances
  - Deliriant Substances
  - Food contamination/adulteration..
  - Substance causing Spinal and cardiac toxicity
  - Substances causing Asphyxia (Asphyxiants)
  - Household toxins
  - Toxic envenomation

- Biological and Chemical warfare.

## **PAPER – IV: Forensic science and recent advances in forensic medicine and toxicology**

### **FUNDAMENTALS OF FORENSIC SCIENCES**

- Interpret the scene of crime.
- Examine – bloodstains for blood grouping, seminal stains & hair for medico- legal purpose.
- Recent advances in forensic medicine and toxicology

### **METHOD OF TRAINING:-**

1. The training programme must mainly aim at practical service element exposure & not merely on didactic lectures. Candidates must actively participate in PM Examination, Clinical Medico legal cases, Laboratory work, Clinico-pathological Conferences, Seminars, Journal Clubs, Group Discussions, Visit to Scene of crime, Court Evidence & Research work. The facilities offered by other Clinical & Basic Science Departments are made available to them.
2. All the Post Graduate students shall work as Full time residents during their tenure. They shall be given full time assignments with responsibility and opportunity of participation in all facets of the Educational & Application process.
3. The training programme must be arranged in such a manner that the candidate gets maximum exposure to variety of required cases & assignments mentioned at Sr. No. 1 above. The purpose is to ensure that candidate acquires the sufficient knowledge, approach & Skills so that he/she can independently work as a Specialist after the end of their PG tenure.

4. The postgraduate Student must perform round o clock duties in relation to Autopsies , Clinical Medico legal work , Cases in wards & Academic work as per the assignments given by the Head of the Department.
5. The postgraduate Student shall be required to actively participate in the Teaching / Training programmes of undergraduates, nursing students, interns, pg students, medical officers, police officers and legal professionals.
6. During the period of training, the postgraduate Student should be in regular contact with his PG Guide & Head of the Department & should continue research work during the performance of the assigned Departmental Duties.
7. Training in medical audit, management, Health economics, Health information System, biostatistics, Human behavioural studies, Pharmaco-economics & Non-linear mathematics shall be imparted.
8. The postgraduate Student should maintain a Log Book of the work assigned to him. This log book will be assessed by the postgraduate Guide of the Student will be Jointly evaluated by the Guide & Head of the Department. The log book must be kept in the Dept.
9. The postgraduate Student should preferably posted for two six months terms in case of a Degree & one six month term in case of Diploma, in the unit of concerned Guide to enable him / her complete the Dissertation work.
10. 50 % marks in internal assessment & 85 % attendance is mandatory for grant of the term/s & also for appearing for the University Examination.
11. It is desired that the postgraduate Students participate in the research work & attend Conferences / or Seminars & / or Workshops for the professional excellence.
12. It is necessary that The postgraduate Students are well versed with relevant basic & appropriate applied aspects of allied Pre, Para - Clinical Disciplines & also with the set up of Forensic Science Laboratory. The rotatory postings of the postgraduate Students will be arranged to make them a Comprehensively Competent Medico legal Expert in anticipation of their quality contribution to the cause of Productive Crime

Investigation & Good Health care of the Community. The field application of the Faculty of Forensic Medicine is very vast & by the same time Medico legal cases take a complicated / sensitive turn at number of occasions. Parent Department, Home Department, Judiciary & Society expect a certain positive approach from Medico legal experts, which always is not possible. The rotatory training programme must be intelligently arranged to make them Competent Experts with required wiseness.

**Table showing tenure wise duration & assignments of rotational Postings of students.**

DEPARTMENT	PERIOD OF POSTING	ASSIGNMENT / CONTENTS OF THE POSTING
Anatomy	2 Weeks	Dissection techniques, Gross & Histological appearances of Vital Organs & Endocrines. Forensic Osteology, Anthropometry, Embalming & Relevant Embryology.
Physiology & Biochemistry(CCL)	1 Week	Functional aspects of Vital Organs & E endocrines, Physiology & Biochemistry of Blood, Semen, Saliva, Sweat, CSV , P.M.Biochemistry of B.Fluids
Casualty	1 month	First Aid , Examination, Diagnosis & Medical + Medico Legal Management of Clinical Medicolegal cases, Dyeing Declaration,Gastric Lavage, Parental Injections,Emergency Tray, Casualty Administration in Mass Disasters.
Medicine+ Paediatrics +Psychiatry+ Pharmac+Medical Record Section	3 Weeks	Awareness Of Diagnosis,ML Aspects & Management of Critical Care,Poisoning & Psychiatry cases,Visit to MICU Set Up,imp. Pediatric Procedures +NICU Set Up, Pharmacology & Detection Of Drugs of Dependence,

Surgery + Orthopedics +Dentistry + Radiology + Anesthesiology	3 Weeks	Awareness regarding Examination, Diagnosis & Medical + Medico Legal Management of cases Of Imp. Regional Injuries (Poly trauma & Burns), Injury certification & Disability Evaluation, X-ray findings in Bony Trauma Age determination cases Visit to Surgical ICU & Operation Theatre, Awareness of imp Anesthetic Procedures, Important OT Instruments & Equipments,
Obstetrics & Gynaecology	1 Week	Abortion , Sterilization Techniques, Introduction to Major ObGy Procedures, Prenatal Diagnostic Techniques,
Forensic Science Laboratory	2 Weeks	Introduction to various sections of the FSL Setup & Instrumentation, Introduction to & relevant awareness of imp Qualitative & Quantitative Detection & Analytical Techniques. Introduction to & relevant awareness of Identification, Biology, Chemistry, Toxicology & Ballistics Divisions.

**The purpose of posting to other departments is to learn practical aspects of those subjects.**

**Monitoring:** - By concerned Head of the departments who certifies the work diary / Logbook maintained by the students at the end of the posting.

## **DISSERTATION**

### **Objectives**

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

### **Guide for Dissertation:**

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 Dissertation Protocol**

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

1. Protocol in essence should consist of:
  - b) Introduction and objectives of the research project.
  - c) Brief review of literature.
  - d) Suggested materials and methods, and
  - e) 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 PIMS (Deemed University), Loni.

### **Submission of Dissertation:**

1. Dissertation will be submitted six months prior to examination.
2. Dissertation 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 Dissertation :** Dissertation will be evaluated in accordance with the existing regulations of the PIMS (Deemed University), Loni.

## **SCHEME OF EXAMINATION**

### **Written**

Assessment of candidates on completion of MD course will be carried out in accordance with the Existing rules and regulations of the PIMS (Deemed University), Loni.

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

**Theory - Will consist of four papers as under:**

- Q. Paper 1.** Basic Medical sciences and allied subjects as applicable to forensic medicine and toxicology syllabus
- Q. Paper 2.** Clinical forensic medicine, forensic psychiatry, medical ethics and law (medical jurisprudence)
- Q. Paper 3** Forensic pathology, Toxicology, Anthropology
- Q. Paper 4.** Forensic science and recent advances in forensic medicine and toxicology

**Each Paper will be:**

**Full Question: 3 X 20 Marks each = 60 Marks**

**Short Notes : 4 X 10 Marks each = 40 Marks**

## **Practical**

<b>01. Post Mortem Examination</b>	<b>100</b>
• Adult Autopsy and/or Foetal Autopsy	
<b>02. Clinical forensic medicine</b>	<b>100</b>
I) Age Certificate	20
II) Alcoholic Certification	20
III) Injury Report	20
IV) Insanity Certification	20
V) Impotency Certificate	20
<b>03. Examination of Exhibit (Min.-1 &amp; Max. -2 from each)</b>	<b>50</b>
A) Weapon report	10
B) Photographs of M.L. Importance	10
C) X ray Examination	10
D) Examination of bones	10
E) Poisons	10
<b>04. Forensic Pathology (Min.-1 &amp; Max. -2 from each)</b>	<b>50</b>
A) Histo-Pathological Slides	10
B) Morbid Specimens	10
C) Examination of Blood / Semen/ Saliva	10
D) Gram Stain	10
E) H & E Stain	10
<b>05. Communication and Teaching Skills</b>	
Thesis Presentation to evaluate teaching ability	25



## 06. Expert Opinion

Case File / Case Study	25
------------------------	----

## 07. Grand Viva-voce

Table 1.	25
----------	----

Table 2.	25
----------	----

---

Total-	400
--------	-----

## Practical Examination (Two days)

### Day 1

- **Thesis Presentation** - For assessment of research capability
- **Presentation of a Topic (Seminar)** - To evaluate teaching ability
- **Clinical Cases** - 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** - Histopathology slides, Photographs, ligature material, X-Rays, Soft tissue specimens, Bones, Poisons and Weapons.
- **Spot tests** - For common poisons and identification of stains (Semen, Blood, Saliva)

### Day 2

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

## **Books and Journals Recommended:-**

1. Modi, Test Book of Forensic Medicine Edited by C.J. Franklin, N.M. Tripathi Pvt. Ltd.- 21<sup>st</sup> Edition
2. K.S. Narayana Reddy, Essentials of Forensic Medicine and Toxicology, Medical Book company, Hyderabad- 17<sup>th</sup> Edition 1998
3. C. J. Parikh, Text Book of Medical jurisrudance, Medical Publications Bombay, 6<sup>th</sup> Edition.
4. Keith Mant, Taylor, Principle and Practice of Medical Jurisprudence, Churchill Livingstone, 13<sup>th</sup> Edition 1984
5. Gujrat, Forensic Medicine, Oriennt Langman, 1<sup>st</sup> Edition
6. Gordon and Shapiro, Forensic Medicine, Churchil Livingstone,
7. Bernand Kright , Legal aspects of Medical Practice, Churchil Livingstone, 5<sup>th</sup> Edition.
8. Polson, Clinical Toxicology , Pittrman Books, 3<sup>rd</sup> Edition.
9. J. B. Mukherjee, Forensic Medicine and Toxicology Vol I, II, and III, 2<sup>nd</sup> Edition.
10. J. K. Mukherjee, Forensic Medicine and Pathology, Chorprman and Hall Medical, 1<sup>st</sup> Edition 1989.
11. Bernand Kright, Forensic Pathology, Arnold, 2<sup>nd</sup> Edition 1996
12. V. P. Patnaik, Krishnan's Hand Book of Forensic Medicine, Paras Publishing, 11<sup>th</sup> Edition
13. Apurbh Nandy, Principles of Forensic Medicine, Chopman and Hall Medicine, 1<sup>st</sup> Edition
14. J. K. Mason, Forensic Medicine, Chopman and Hall Medical, 1<sup>st</sup> Edition.
15. Bernand Knight, Simpson's Forensic Medicine, Arnild, 11<sup>th</sup> Edition 1991
16. Keith Simpson, Modern Trends in Forensic Medicine Vol- I and II
17. C. G. Tedeschi Forensic Medicine- Physical Trauma Vol- I and II
18. Franci's camps, Gradwohl's Legal Medicine, Bristol, John wright and sons, III Edition
19. Franci's camps, Grandwohl's Legal Medicine
20. Allen Moritz, Pathology of Tranuma

21. Gresham and Turner, Post Mortem procedures, Wolfe Medical Publications, II Edition
22. V.V. Pillay, Modern Medical Toxicology, Jaypee brothers, II edition

**Journals:**

1. Journals of Indian Academy of Forensic Medicine
2. Journal of Karnataka Medico- Legal Society
3. Journal of Forensic Medicine and Toxicology
4. Journal of Forensic Sciences – American Academy of Forensic Sciences.
5. Medicine, Science and Law – British Academy of Forensic Sciences.
6. Journal of Indian Academy Society of Toxicology
7. American Journal of Forensic Pathology & Legal Medicine
8. Journal of Clinical Toxicology.
9. Journal of Forensic & Legal Medicine
10. Medical Law cases for Doctors
11. Journal of Medicolegal Association of Maharashtra