SYLLABUS
for
II - MBBS
(Para - Clinical Subjects)

2014-15
CURRICULUM
IN
FORENSIC MEDICINE
AND
TOXICOLOGY
1. GOAL

The broad goal of teaching undergraduate students Forensic Medicine is to produce a physician who is well informed about Medico-legal responsibility during his/her 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. He/She acquires knowledge of law in relation to Medical practice, Medical negligence and respect for codes of Medical ethics.

2. EDUCATIONAL OBJECTIVES

KNOWLEDGE

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

1. Identify the basic Medico-legal aspects of hospital and general practice

2. Define the Medico-legal responsibilities of a general physician while rendering community service either in a rural primary health centre or an urban health centre

3. Appreciate the physician’s responsibilities in criminal matters and respect for the codes of Medical ethics

4. Diagnose, manage and identify also legal aspect of common acute and chronic poisonings

5. Describe the Medico-legal aspects and findings of post-mortem examination in cases of death due to common unnatural conditions and poisonings

6. Detect occupational and environmental poisoning, prevention and epidemiology of common poisoning and their legal aspects particularly pertaining to Workmen’s Compensation Act
7. Describe the general principles of analytical toxicology

8. Understand Clinical Forensic Medicine

9. Understand issues in organ transplantation

SKILLS

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

2.2.1 make observations and logical inferences in order to initiate enquiries in criminal matters and Medico-legal problems

a. to be able to carry out proper Medico-legal examination and documentation/ Reporting of Injury and Age
b. to be able to conduct examination for sexual offences and intoxication
c. to be able to preserve relevant ancillary materials for medico-legal examination
d. to be able to identify important post-mortem findings in common unnatural deaths and be able to distinguish between Natural and Un-natural deaths.
e. to diagnose and treat common emergencies in acute and chronic poisoning
f. to observe the principles of medical ethics in the practice of his profession

INTEGRATION

Department shall provide an integrated approach towards allied disciplines like Pathology, Radiology, Forensic Sciences, Hospital Administration etc. to impart training regarding Medico-legal responsibilities of physicians at all levels of health care. Integration with relevant disciplines will provide scientific basis of clinical toxicology e.g. Medicine, Pharmacology etc.
3. DURATION OF TEACHING

Semesters - 3
Teaching Days - 252
Teaching hours - 100

4. SYLLABUS

a) LEARNING METHODS

Lectures, tutorials, practical demonstrations, group discussions and seminars

Distribution of teaching hours

Didactic lectures should not exceed one third of the time schedule, two third schedules should include Practicals, Demonstrations, Group discussions, Seminars and Tutorials.

Learning process should include living experiences and other case studies to initiate enquiries in criminal matters and Medico-legal problems.

A) Theory : Lectures ..... 40 hours
   (including Tutorials, Seminars & Allied) ..... 20 hours
   Total ..... 60 hours

B) Practicals ..... 25 hours
   (including demonstrations) ..... 15 hours
   Total ..... 40 hours

This period of training is minimum suggested. Adjustments, whenever required, depending on availability of time, may be made.
CONTENTS & DIVISION

1. PART – 1 FORENSIC MEDICINE:
   A) INTRODUCTION
      i. Definition, Scope Relevant To Subject
      ii. History of Forensic Medicine
      iii. Need, Scope, Importance and probative value of Medical evidence in Crime Investigation
   
   B) FORENSIC IDENTITY:
      i. Introduction, definition, types, corpus delicti
      ii. Data useful for Identification of Living and Dead
      iii. Age estimation and its medico-legal Importance
      iv. Sex determination and it’s medico-legal importance
      v. Other methods of establishing identity:
         Dactylography, Tattoo marks, Deformities, Scars
      vi. Identification of decomposed, Mutilated bodies and skeletal remains
      vii. Medico legal aspect of DNA fingerprinting - a brief introduction
      viii. Value for evidence in crime
      ix. Medico-legal aspect of blood and blood stains.
   
      Note: Collection, Preservation and Dispatch of Specimen for Blood and other ancillary material for identification and Medico-legal examination.

   C) THANATOLOGY:
      i. Definition and concept of death, Brainstem Death in relation to Organ Transplantation
      ii. Causes of sudden Natural deaths
      iii. Changes after death, Cooling, Hypostasis, Changes in eye, Muscle changes, Putrefaction, Adipocere, Mummification, Estimation of time since death
      iv. Presumption of death and survivorship, disposal and preservation of dead bodies
D) MEDICO-LEGAL AUTOPSY
   i. Autopsy: Objectives, Facilities, Rules and Basic techniques, Proforma for reporting medico-legal autopsy
   ii. Exhumation, examination of mutilated remains, Obscure autopsy and post-mortem artifacts

E) TRAUMA
   i. Definition and classification of injuries:
   ii. Blunt force Trauma : Abrasions, Contusions and Lacerations
   iii. Sharp force Trauma : Incised, Stab and Chop wounds
   iv. Physical methods of Torture and their identification
   v. Firearm injuries and Explosive injuries and Basics of Firearms
      a) PM examination of Firearm injury deaths.
      b) Removal and collection of Bullets, Pellets etc.
   vi. Complications and causes of death due to injury.
   viii. Causative Weapon and appearance of Suicidal, Accidental and Homicidal injuries.
   ix. Regional injuries: Head injury, mechanism, Injury to Scalp, Skull, Brain and Spinal Injuries
   x. Intracranial Haemorrhage, changes in Brain
   xi. Road Traffic Accidents
   xii. Thermal injuries: Injuries due to heat and cold, Frostbite, Burns, Scalds and Bride burning
   xiii. Injuries due to Electricity, Lightening
   xiv. Non-Accidental Domestic Violence
   xv. Starvation deaths

Note: Collection, Preservation and Dispatch of Specimen for Blood and other ancillary material for Medico-legal examination.
F) MEDICO-LEGAL ASPECTS OF SEX, MARRIAGE AND INFANT DEATH

i. Explanation and ML Importance of Terminologies: Impotence, Sterility, Virginity, Pregnancy, Delivery, Paternity, Legitimacy, Assisted Reproductive Technique Medico Legal Aspects and PNDT Act,

ii. 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. with new amendments.

iii. Examination of Rape and Sodomy cases.

iv. Abortions, Medical Termination of pregnancy, Criminal abortions and relevant IPC sections.

v. Infant death:
   a) Explanation of Terminologies Viability Live Births, Deadborn, Stillborn
   b) Determination of age of Foetus and Infant with special reference to 3, 5, 7 & 9 months of I.U.Age
   c) Infanticides: Autopsy to confirm Livebirth, period of survival, causes of deaths
   d) Battered Baby Syndrome and Sudden Infant Death Syndrome.

Note: Collection, Preservation and Dispatch of Specimen: Hair, seminal fluid/stains and other ancillary material for medico-legal examination, examination of seminal stains and vaginal swabs.

G) ASPHYXIAL DEATHS:

i. Introduction, Pathophysiology, General Signs-Symptoms Asphyxia

ii. Hanging: Definition, Types and Causes of death, PM Finding, MLI

iii. Strangulation, Suffocation and Traumatic Asphyxia: Definition, Types and causes of death, PM Finding, MLI

H) FORENSIC PSYCHIATRY
   i. Basic concepts of Forensic Psychiatry in respect of Civil and Criminal responsibility
   ii. Examination, Certification, restraint and admission to Mental Hospital
   iii. Mental Health Act 1987: Principles and Objectives

2. PART – 2 TOXICOLOGY:

A) GENERAL PRINCIPLES :
   i. Introduction to Toxicology
   ii. Epidemiology of poisoning
   iv. Basics of Environmental and Industrial Toxicology in relation to Health & Ecology;
   v. Common poisons and their classification, Identification of common poisons, Routes of Administration, Actions of poisons and factors modifying them, Diagnosis of poisoning (Clinical and Confirmatory), Treatment / Management of cases of acute and chronic poisoning.
   vi. Analytical Toxicology (Principles: Bedside & Common Lab. Tests), Collection, Preservation and Dispatch of Viscera to FSL

B) CORROSIVE & IRRITANT POISONS:
   i. Inorganic Corrosives- Sulphuric, Nitric & Hydrochloric Acid
   ii. Organic Corrosives- Phenol, Oxalic Acid
   iii. Inorganic Non-Metallic Irritants - Phosphorus, Halogens
iv. Inorganic Metallic Irritants- Arsenic, Lead, Mercury, Copper


vi. Organic Animal Irritants – Snake Bite, Scorpion & other common insect bites diagnosis and Management; Medicolegal Aspects

vii. Mechanical Irritants- diagnosis and treatment & Medicolegal Aspects

C) NEUROTOXIC:

i. Inebriates- Ethyl Alcohol, Methyl Alcohol

ii. Somniferous and Sedative Hypnotics – Opium and Derivatives, Barbiturates

iii. Deliriants- Dhathura, Cannabis, Cocaine.

iv. Insecticides/ Pesticides/ Agrochemical- Organo-phosphorus Compounds, organo-chlorides, Carbamates, Pyrethriods, Aluminium phoshide.

v. Spinal Poisons- Strychnine

vi. Peripheral Poisons- Curare

D) ASPHYXIANTS (GASES)-
Carbon monoxide, Carbon Dioxide, Cyanogens and Cyanides

E) CARDIAC POISONS-
Oleanders, Aconite, Tobacco

F) OTHER POISONS:

i. Domestic/ Household Poisons- Kerosene, Detergents, Disinfectants, Cosmetics, Rodenticide mothballs etc.

ii. Therapeutic Drug Toxicity/ poisoning by Medicines Salicylates, Paracetamol, Newer derivatives of sedatives

iii. Food Poisoning- Bacterial, Viral, Mushrooms, Chemical etc.

iv. Drugs of dependence and Drug Abuse
3. PART – 3 MEDICAL JURISPRUDENCE:

A) LEGAL AND ETHICAL ASPECTS OF PRACTICE OF MEDICINE

i. The Indian Medical Council and State Medical Council: Formation, Functions
ii. Rights, Privileges and Duties of Registered Medical Practitioners
iii. Infamous conduct, Professional secrecy and privileged communications
iv. Medical Ethics and prohibition of Torture & care of Torture Victims
v. Consent – Its relevance in Medical Practice & medical record maintainance.
vi. 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
vii. Euthanasia – Current views and dilemmas, Different codes of Medical Ethics and Ethics in Research
viii. Common medico-legal problems in Hospital practice
ix. Medico-legal, ethical & social problems in relation to AIDS

4. **PART – 4 LEGAL PROCEDURES IN MEDICO-LEGAL CASES:**

   i. Medico-Legal Investigations of death in suspicious circumstances, different Inquest, type of offences
   
   ii. Types of Criminal courts and their powers, punishments prescribed by law, kinds of witnesses, Evidence, Documentary Medical evidence, Dying declaration and Dying deposition
   
   iii. The Trial of criminal cases, Rules and Conventions to be followed by Medical Witness at Medical evidence, subpoena, conduct money
   
   iv. Relevant Sections from the Indian Evidence Act, Indian Penal code and Criminal Procedure code

**PRACTICALS (INCLUDING DEMONSTRATIONS)**

Practicals will be conducted in the laboratories. Objective will be to assess proficiency in skills, conduct of experiment, interpretation of data and logical conclusion. Emphasis should be on candidate’s capacity in making observations and logical inferences in order to initiate enquiries in criminal matters and medico-legal problems.

Contents:

**Part 1 Forensic Medicine**

**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 for Medico-legal purpose to determine age, sex, stature, cause of death, time since death
   a. Skull and Mandible
   b. Pelvis, Sternum
   c. Femur, Humerus

**Study of:**

8. Medical certification of cause of Death as per Birth and Death registration Act [Prescribed Forms]

9. Studies of Skiagrams 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

13. Demonstration of Instruments:
   a) Used in treatment of acute poisoning cases
   b) Used for causing abortions
   c) Used for conducting autopsy (Dissection Set)

**Part 2 Forensic Toxicology**

1. Examination/Certification of Alcoholic
   [Prescribed Forms ‘A’ & ‘B’]

2. Study of Common poisons:
   [Sulphuric Acid, Nitric Acid, Hydrochloric Acid, Carbolic Acid and Oxalic Acid, Phosphorous, Lead, Arsenic, Mercury, Copper, Glass powder, Castor, Croton, Calatropis Abrus Precatorius (Ratti), Dhatura, Cannabis Indica, Opium, Aconite, Yellow Oleander, Strychnine, Snakes, Scorpion, Alcohol, Methyl]
Alcohol, Kerosene, Organo-phosphorus compounds, Organo Chloro compounds, Carbamates (Carbaryl) and other commonly used poisons, antidotes and preservatives

**Part 3 Medical Jurisprudence**

**Study of Medical Certificates [Prescribed Forms]**

- a. Sickness Certificate
- b. Fitness Certificate
- c. Certificate of Physical fitness
- d. Medical certificate prescribed under Mental Health Act: 1987
- e. Medical Certificate of Sound/Unsoundness of mind.

**Part – 4 Legal procedures in medico-legal cases**

**Orientation of various formats of specified forms:**

Consent to surgery Anaesthesia and other Medical services, Request for sterilization, Consent to access to hospital records, Authorization for Autopsy, Dead body Challan used for sending a dead body for post-mortem examination, Request for the second inquest by Magistrate on the dead body, Provisional post-mortem certificate, Post-mortem form, Pictorial Post-mortem form, Form for the Final cause of death, Forms for despatch of exhibits other than the viscera to chemical analyser, Forms for despatch of Viscera for Histopathological Examination, Form for dispatch of viscera to chemical analyser, Forensic Science Laboratory report form, Summons to witness.

Each student shall attend and record as a clerk

- a. As many as possible cases / items of medico-legal importance
- b. 10 cases of medico-legal autopsies

Efforts be made so that each student will attend the court at least 2 cases when Medical Evidence is being recorded.
BOOKS RECOMMENDED

1. Modi’s Textbook of Medical Jurisprudence and Toxicology
2. The Essentials of Forensic Medicine & Toxicology by K.S. Narayan Reddy
3. Text Book of Forensic Medicine – J.B. Mukherjii VOL 1 & 2
4. Principles of Forensic Medicine - A. Nandy
5. Bernard Knight et. All: Cox’s Medical Jurisprudence & Toxicology
6. Krishnan Handbook of Forensic Medicine, V.V. Pillay
7. Text Book of Forensic Medicine & Toxicology – Krishna Viz
8. Text Book of Forensic Medicine & Toxicology – R. Basu

REFERENCE BOOKS

1. Russell S. Fisher & Charles S. Petty: Forensic Pathology
2. Keith Simpson: Forensic Medicine
4. Gradwohl – Legal Medicine
5. A Doctors Guide to Court – Simpson
6. Polson C.J.: The essentials of Forensic Medicine
8. Atlas of Legal Medicine (Tomro Watonbe)
10. A Hand Book of Legal Pathology (Director of Publicity)
12. Ratanlal & Dhirajlal, The Indian Penal Code; Justice Hidayatullah & V.R. Manohar
15. Medical Law & Ethic in India – H.S. Mehta
16. Bernard Knight : Forensic Pathology
19. FE Camps, JM Cameren, David Lanham : Practical Forensic Medicine

5. EVALUATION

METHODS
Theory, Practical & Viva

Passing: A candidate must obtain minimum 50% marks in Aggregate, with a minimum of 50% marks in Theory+Orals & minimum 50 % in Practicals in University examination.

PATTERN OF THEORY EXAMINATION

(A) First & Second Terminal Examination (Internal Assesment)
Nature of Question Paper
i) Duration - 2 hrs (one paper of 2 hrs or 120 minutes)
ii) The paper will have 3 sections
Suggested pattern and marking for paper of 40 marks

<table>
<thead>
<tr>
<th>Section</th>
<th>Question</th>
<th>Pattern of Question</th>
<th>Number of Question</th>
<th>Marks</th>
<th>Time</th>
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<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>Multiple choice questions (MCQ)</td>
<td>16 (all compulsory)</td>
<td>$16 \times \frac{1}{2}$ each = 08</td>
<td>20 minutes</td>
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<tr>
<td>B</td>
<td>2</td>
<td>Short answer questions (SAQ)</td>
<td>4 (out of 05)</td>
<td>$04 \times 02$ each = 08</td>
<td>01 hour 40 minutes</td>
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<td>3</td>
<td>Structured long answer question (LAQ)</td>
<td>1 (compulsory)</td>
<td>$01 \times 08$ = 08</td>
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<tr>
<td>C</td>
<td>4</td>
<td>Short answer questions (SAQ)</td>
<td>4 (out of 05)</td>
<td>$04 \times 02$ each = 08</td>
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<td></td>
<td>5</td>
<td>Structured long answer question (LAQ)</td>
<td>1 (compulsory)</td>
<td>$01 \times 08$ = 08</td>
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<td>Total 40 marks</td>
<td>02 hours</td>
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(B) Third Terminal / Preliminary (Internal Assessment) & University Examination
Nature of Question Paper

i) Duration - 2 hrs (one paper of 2 hrs or 120 minutes)
ii) The paper will have 2 sections
Pattern of Theory Examination

<table>
<thead>
<tr>
<th>Section</th>
<th>Question</th>
<th>Pattern of Question</th>
<th>Number of Question</th>
<th>Marks</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>One sentence answer questions</td>
<td>8 (out of 10)</td>
<td>08 x 01 each = 08</td>
<td>02 Hours</td>
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<td>2</td>
<td>Structured long answer questions (LAQ)</td>
<td>2 (out of 3)</td>
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<tr>
<td>B</td>
<td>3</td>
<td>Short answer questions (SAQ)</td>
<td>6 (out of 08)</td>
<td>06 x 03 each = 18</td>
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<td>Total 40 Marks</td>
<td>02 Hours</td>
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PATTERN OF PRACTICAL EXAMINATION

(A) First Terminal Examination (Internal Assessment)

PRACTICAL: Will be of 25 marks and the distribution of marks will be as follows:

1: Practical 15 Marks
2: Viva (oral) 10 Marks

Practical: Distribution recommended as follows:

1) Structured question station (2 marks each × 5 Nos) 10 Marks
2) Certificate (5 marks × 1 Nos) 05 Marks
Note:
1. Structured question station includes: Bones, Weapons, X rays, Photographs, Specimens etc.
2. Certificates include:- Death/Sickness/Fitness/Physical fitness Certificate
   - Report of Examination for Age/Drunkenness/Injury/Sexual offence (Victim & Accused)

(B) Second Terminal Examination (Internal Assessment)

PRACTICAL: Will be of 40 marks and the distribution of marks will be as follows:

1: Practical 30 Marks
2: Viva (oral) 10 Marks

Practical: Distribution recommended as follows:

1) Structured question station (2 marks each × 10 Nos) 20 Marks
2) Certificates (5 marks each × 2 Nos) 10 Marks

Note:
1. Structured question station includes:
   Bones, Weapons, X rays, Photographs, Specimens etc.
2. Certificates include:
   (a) Medical Certificate: Death/Sickness/Fitness/Physical fitness certificate.
   (b) Medico-legal Report/Certificate: Examination for Age / Drunkenness / Injury / Sexual offence (Victim & Accused)
(C) Third Terminal / Preliminary (Internal Assessment) & University Examination

**PRACTICAL:** Will be of 40 marks and the distribution of marks will be as follows:

1: Practical 30 Marks
2: Viva (oral) 10 Marks

**Practical:** Distribution recommended as follows:

1) Structured question station (1.5 marks each × 10 Nos) 15 Marks
2) Certificates (5 marks each × 2 Nos) 10 Marks
3) Toxicology Spots (1 mark each × 5 Nos) 05 Marks

**Note:**
1. Structured question station includes:
   Bones, Weapons, X rays, Photographs, Specimens etc.
2. Certificates includes:
   (a) Medical Certificate: Death/Sickness/Fitness/Physical fitness certificate.
3. Toxicology spots includes: Poisons, Drugs, Articles.

**Viva/Oral:** Distribution recommended as follows:

- Table 1: Forensic Medicine 05 Marks
- Table 2: Toxicology, Psychiatry, Legal Procedures, Medical Jurisprudence: 05 Marks

**PATTERN OF INTERNAL ASSESSMENT**

**III Semester:**

1) Mid Term Exam: 15 marks
2) Terminal Exam:
   Theory: One Paper: 40 marks, Practicals including Viva: 25 marks
**IV Semester:**

1) Mid Term Exam: 15 marks  
2) Terminal Exam:  
   Theory: One Paper: 40 marks, Practicals including Viva: 40 marks

**V Semester:**

1) Mid Term Exam: 15 marks  
2) Preliminary Exam:  
   Theory: One Paper: 40 marks, Practicals including Viva: 40 marks

**Note:** Best 2 (out of 3) Mid term exam marks will be added to Theory marks.

**Theory:** Marks secured in Theory & Mid term examinations will be converted to out of 10 marks.

**Practicals:** - Marks secured in Practical examinations will be converted to out of 7 marks.  
   - Day to day practical work and journal will be evaluated for 3 marks.

**Total Internal Assessment Marks:** 10 (Theory) + 10 (Practicals) = 20 marks

**Internal Assessment Calculation:** Fraction will be rounded to nearest whole figure e.g. if less than \( \frac{1}{2} \) it will be brought to previous round figure. If it is \( \frac{1}{2} \) or more it will be taken to next round figure.

**NOTE:** For qualifying for University Examination, a Candidate should obtain minimum 35% marks in internal assessment.
Heads of Passing In University Examination

<table>
<thead>
<tr>
<th>Theory + Orals (40+10)</th>
<th>Practicals</th>
<th>Internal Assessment (Theory 10 + Practical 10)</th>
<th>Total</th>
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<tbody>
<tr>
<td>50 marks</td>
<td>30 marks</td>
<td>20 marks</td>
<td>100 marks</td>
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</table>

**Passing:** A candidate must obtain minimum 50% aggregate marks with a minimum 50% marks in Theory + Orals & minimum 50% marks in Practicals.