Amrita School of Medicine

Curriculum
MD Forensic Medicine

(Revised with effect from 2016-2017 onwards)
Table of Contents
Programme Goal ................................................................................................................................. 3
Program Outcomes............................................................................................................................... 3
Program Specific Outcomes ............................................................................................................... 3
Program Structure ............................................................................................................................. 4
M.D Degree Examination Mark Distribution .................................................................................... 9
Attendance, Progress And Conduct ................................................................................................. 14
Programme Goal

The Postgraduate programme aims at imparting necessary training to a graduate so that s/he would become a competent expert in Forensic Medicine and Toxicology.

Program Outcomes

At the end of the three year training programme, the learner should be able to:

**PO1:** Identify and categorize all types of medicolegal problems as they emerge in the community and to work to resolve such problems by planning and implementing requisite medicolegal services in Forensic Pathology, Clinical Forensic Medicine and Toxicology.

**PO2:** Utilize the knowledge and skills acquired in allied specialties such as Forensic Science, Forensic Psychiatry, Forensic Radiology, Forensic Osteology and Forensic Odontology when necessary.

**PO3:** Undertake medicolegal responsibilities and discharge medicolegal duties, which arise in day-to-day practice.

**PO4:** Keep himself/herself abreast of all recent developments and emerging trends in the field of Medical Ethics and Law.

**PO5:** Evaluate his/her professional activities, educational needs and select appropriate learning resources periodically.

**PO6:** Deal with general principles and practical problems related to clinical, emergency, environmental, medicolegal and occupational aspects of Toxicology.

**PO7:** Impart education in Forensic Medicine and Toxicology to undergraduate and postgraduate students with the help of modern teaching aids.

Program Specific Outcomes

At the end of the training programme, the postgraduate resident should be able to:

**PSO1:** Perform medicolegal autopsy independently, prepare report and derive inferences.

**PSO2:** Interpret histopathological, microbiological, radiological, toxicological and DNA analysis and other investigative reports for medicolegal purposes.

**PSO3:** Assist and advise police in the examination of crime scenes, collection of trace evidence and scientific methods of criminal investigation.

**PSO4:** Appear as an expert witness in a Court of Law on medicolegal matters and tender evidence.

**PSO5:** Describe relevant legal/court procedures applicable to medicolegal/medical practice.

**PSO6:** Identify, examine and prepare reports in Clinical Forensic Medicine.

**PSO7:** Identify and discharge all legal responsibilities in medicolegal matters.

**PSO8:** Plan, organize and supervise medicolegal work in general/teaching hospitals.

**PSO9:** Interpret, analyze and review medicolegal reports prepared by other Medical Officers.

**PSO10:** Collect, preserve and dispatch various kinds of trace evidence to the authority concerned.

**PSO11:** Identify and articulate principles of medical ethics in relation to the patient, profession, society, state, and humanity at large.

**PSO12:** Interpret and advise authorities on matters related to Medical Ethics and the Law.

**PSO13:** Discharge duties in respect of clinical, emergency, environmental, medicolegal and occupational aspects of Toxicology.

**PSO14:** Plan, organize and manage Toxicological Laboratory services.
PSO15: Provide information and consultation on all aspects of toxicology to professionals, industry, Government and public at large.

PSO16: Able to plan, develop and manage poison information and medicolegal centers at teaching and non-teaching hospitals.

Program Structure

Duration of the postgraduate course shall be three years, organized into six semesters. Throughout the course, the students shall be posted in Forensic Pathology, Clinical Forensic Medicine and Toxicology. Training in Forensic Sciences, Forensic Radiology, Forensic Osteology, Forensic Odontology and Forensic Psychiatry will be given apart from practicing routine medicolegal work. The postgraduate students shall be required to take part in the teaching and training programme of the undergraduate students.

The student should meticulously keep a current record of his/her academic activities, postings, attendance of conferences and CME programmes etc. in the Log Book. **It is mandatory for the postgraduate students to present a poster, a paper and to have a publication to make them eligible to appear for the postgraduate degree examination.** The Log Book should be submitted at the end of each semester to the HOD. The Log Book should be submitted to the Principal’s Office at the end of 2nd and 4th semesters. It should be submitted in its final form at the end of 6th semester.

Before the end of 1st, 2nd, 3rd and 4th semesters, the student should present a progress report of his/her dissertation work in the department.

There will be an end-semester theory/practical examination at the end of 1st to 5th semesters and a model examination during the 6th semester. The marks of these formative assessments will be used to calculate the internal average.

**1st Semester**

**1st month**

Orientation training

**2nd to 6th Months**

The student should acquire basic autopsy skills and knowledge of the fundamentals of FMT, including the working of CFMU, DNA Research Lab & Toxicology Lab. S/he should attend and participate in undergraduate classes.

By the end of the third month, the student should have selected the topic for dissertation and submitted the protocol for review of Scientific and Ethics Committee. S/he should prepare the first draft of the introduction, materials and methods and review of literature by the end of first semester. It is preferable to choose topics from relatively neglected/new areas of FMT; and each PG from a batch must opt for a separate professor who is eligible to be a guide in an equitable manner.

Acquisition of relevant knowledge in other specialties as detailed below by posting in the department or through horizontal integration and innovative teaching methods.


Microbiology

2nd Semester
The student should start data collection for dissertation work in the second semester itself. Draft of the Introduction, Review of Literature and Materials and Methods should be submitted before the end of 2nd Semester.

S/he should attend and participate in undergraduate classes.

Acquisition of relevant knowledge in other specialties as detailed below by posting in the department or through horizontal integration and innovative teaching methods.


3rd Semester
Depending on the duration of data collection relating to dissertation work, the first draft of Observations and the Results together with Statistical analysis should be submitted at the end of 3rd or 4th Semester.

Acquisition of relevant knowledge in other specialties as detailed below by posting in the department or through horizontal integration and innovative teaching methods.


Odontology:
Forensic Odontology. Bite mark identification. Determination of age and identity

**4th Semester**

The completed Resultsof the dissertation work together with Statistical analysis should be submitted at the end of 4th Semester.

**Toxicology:**
Basics of Venomous Bites and Stings, Neurotoxic Poisons, Cardiovascular Poisons, Substance Abuse and Food Poisoning.


**Forensic Radiology:** Adequate knowledge of Radiological procedures for solution of medicolegal problems. Forensic Radiology in identification, pathology, dentistry, child abuse, trauma, medicolegal implications of radiological procedures.

**5th Semester**

The dissertation work should be completed by the end of 5th semester and submitted.

**Court Procedure:** Acquiring knowledge about the procedures followed in court during trial and recording of evidence.

**6th Semester**

There will be a series of model examinations (written and practical) during the 6th semester.

**The Programme is divided into the Following Courses (Course Code in Brackets):**

**Paper I (Course 1: MDFM1):** Basic Sciences including Anatomy, Physiology, Biochemistry, Pharmacology, Pathology and Microbiology in relation to Forensic Medicine.

**Course Outcomes**
- **CO1** Knowledge of the functional anatomy, physiology and pathology of vital organs and systems.
- **CO2** Proficiency in histopathological techniques and interpretation of histopathological slides.
- **CO3** Knowledge of the basics of microbiology and biochemistry.


**Pathology:** Detailed study of Injury, inflammation and Repair, Regeneration, Wound Healing, Thrombosis, and Shock.
Basics of diseases of Immune system, Infectious diseases and Environmental diseases, as well as common diseases of Blood Vessels, Heart, Kidney, Liver, Pancreas, Endocrines, Brain and Spinal Cord.

**Microbiology**


**Paper II (Course 2: MDFM2):** Forensic Pathology including Forensic Anthropology, Forensic Odontology and Forensic Radiology

**Course Outcomes**
CO1 Competency to conduct medicolegal autopsy of adult and fetus, examine skeletal remains and furnish report on the same.
CO2 Competency to provide expert opinions from interpretation of reports and evidence from crime scene examinations and material object examination.
CO3 Knowledge of techniques for preservation of biological samples and embalming.

**Odontology:**
Forensic Odontology. Bite mark identification. Determination of age and identity
Gufaston method of estimation of age

Forensic psychiatry

Virtual autopsy

**Paper III (Course 3: MDFM3):** Clinical Forensic Medicine, Forensic Psychiatry and Toxicology

**Course Outcomes**
CO1 Knowledge of court procedures and the ability to provide evidence as an expert witness. Knowledge of the procedure for recording dying declaration
CO2 Ability to furnish reports with scientific opinions based on examination of the injured, the intoxicated and the victim or the accused in medicolegal cases.
CO3 Knowledge in management and medico-legal aspects of poisoning. Basic knowledge of analytical toxicology.
CO4 Knowledge of the function of a poison control centre.
CO5 Ability to examine and report on age, features of identity and bite marks in both living and dead.

Court Procedure: Acquiring knowledge about the procedures followed in court during trial and recording of evidence.
Medico legal aspects

Toxicology:
Basics of Venomous Bites and Stings, Neurotoxic Poisons, Cardiovascular Poisons, Substance Abuse and Food Poisoning.

Accidental ingestion of toxic chemicals
Poisonous plants

Paper IV (Course 4: MDFM4) Recent Advances related to Forensic Medicine & Toxicology and Forensic Sciences

Course Outcomes
CO1 Awareness of DNA analysis and collection and despatch of trace evidences. Knowledge of scientific and investigative techniques and its principles.
CO2 Ability to properly interpret the forensic/toxicological analysis reports and furnish opinions.
CO3 Ability in diagnosis of mental illness and medico-legal aspects of the same. Knowledge of various mental health acts. Proficiency with the provisions on the civil and criminal responsibility of the mentally ill.
CO4 Awareness about the application of various radiological procedures for medicolegal purpose
CO5 Recent advances in Forensic Medicine, Forensic Science and allied subjects.

Knowledge about new scientific and investigative techniques and the ability to properly interpret forensic reports and to give opinion. Knowledge of medico legal aspects of various mental health acts.

Paper IV (Course 5: MDFM5) Soft Skills: Elective Course
CO1 Awareness about different study designs, sample size calculation, different methods of hypothesis testing and clinical trials. Proficiency in conducting a research.
CO2 Proficiency in different aspects of medical ethics and etiquette. Awareness about the responsibilities of being a part of a team/department.
CO3 Proficiency in teaching and the use of various teaching aids.
# M.D Degree Examination Mark Distribution

| **Theory**          | -                        | Four papers  
|                    |                          | Each of three hours duration  
|                    |                          | 400 marks  
| **Paper I - 100 Marks** | -                        | Basic Sciences including Anatomy,  
|                    |                          | Physiology, Biochemistry, Pharmacology, Pathology and  
|                    |                          | Microbiology in relation to Forensic Medicine  
| **Paper II - 100 Marks** | -                        | Forensic Pathology including Forensic Anthropology,  
|                    |                          | Forensic Odontology and Forensic Radiology  
| **Paper III - 100 Marks** | -                        | Clinical Forensic Medicine, Forensic Psychiatry and  
|                    |                          | Toxicology  
| **Paper IV - 100 Marks** | -                        | Recent Advances related to Forensic Medicine &  
|                    |                          | Toxicology and Forensic Sciences  

| **Practical** | - 200 Marks |

| **Day I** | -  
|                  | Determination of Age: Subject/X-Ray - 20  
|                  | Drunkenness / Potency Certification - 20  
|                  | Examination of Injuries: Subject/Photographs - 15  
|                  | Discussion on Gross Specimens - 15  
|                  | Histopathology Slides Examination - 15  
|                  | Analytical Toxicology Exercise - 15  

| **Day II** | -  
|                  | Adult Autopsy/ Fetal Autopsy - 50  
|                  | Examination of Skeletal Remains - 20  
|                  | Expert Opinion on a Medicolegal Case - 15  
|                  | Microteaching Session - 15  

| **Viva Voce** | - 100 Marks  
| **Total** | - 700 Marks  

I Describe the blood supply to the heart. Enumerate the types of occlusion that can occur in the coronary arteries. How will you demonstrate myocardial infarction during autopsy? (20)

II Enumerate the immune mechanisms of tissue injury. Describe the morbid anatomical findings in a case of anaphylactic death following an intramuscular injection of Procaine Penicillin. (20)

III Write Short Notes: (60)

1. Sudden death due to drug interaction
2. Phases of drug trial
3. Metabolic acidosis
4. Gastric emptying
5. Frozen section technique
6. Berry aneurysms of the circle of Willis
7. Opium derivatives
8. Embalming
9. Pulmonary thromboembolism
10. Anaerobic infection in injuries
11. Traumatic myocarditis
12. Cardiomyopathy
I Describe the pathophysiology of burns. How will you ascertain the cause and manner of death in the case of an extensively charred dead body recovered from a burnt hut? (20)

II A dead body of a 35 year old male was found in a deep lake with a faint ligature mark around the neck and a suicide note in his shirt pocket. What are the medicolegal investigations to be conducted to establish the cause, time and manner of death? (20)

III Write Short Notes: (60)

1. Diffuse axonal injury
2. Injury triad
3. Psychogenic causes of erectile dysfunction
4. Holiday heart syndrome
5. Complications of criminal abortion
6. Trauma and tumour
7. Disseminated intravascular coagulation
8. Lightning injuries
9. Transfusion reaction
10. Temporary cavitation
11. Dismemberment
12. Psychological autopsy
Amrita Vishwa Vidyapeetham University
School of Medicine

M.D. Degree in Forensic Medicine
Part III
Clinical Forensic Medicine, Toxicology & Forensic Psychiatry

Time 3 Hours

I. An offender trespassed into the house of a 40 year old widow staying alone, assaulted and raped her. She was brought to you immediately after the occurrence. What are the medicolegal investigations you will conduct to connect the crime with the offender? (20)

II. A person was brought to the casualty in an unconscious state with miosis, bradycardia, and hypotension. How will you diagnose and manage the condition? What are your medicolegal duties? (20)

III. Write Short Notes: (60)

1. Delirium tremens
2. Cardiotoxins
3. Service as defined in the Consumer Protection Act
4. Haemodialysis
5. Cyanogenic plants
6. Mens rea
7. Corporate liability
8. Informed refusal
9. Privileged communication
10. Rosary Pea
You are called to a scene of crime where a person is found dead in a pool of blood. How will you proceed to examine the body and the scene? What are the inferences that could be drawn from the spatter patterns of blood? (20)

What are the modern techniques of DNA typing? What are the advantages of mitochondrial DNA analysis? Comment on the acceptability of DNA evidence in the court of law. (20)

Write Short Notes: (60)
1. Recent amendments to criminal law
2. Virtopsy
3. Carabelli’s cusp
4. 3D reconstruction of face
5. Gustaffson Technique
6. Brain fingerprinting
7. Prostate specific antigen
8. Chemiluminescence test
9. Colposcopy
10. High Performance Liquid Chromatography
11. Radio-active carbon estimation
12. Forensic Sculpting
ATTENDANCE, PROGRESS AND CONDUCT

a) The selected candidate should exclusively work in the School of Medicine, AIMS and allied institutions. They are not allowed to work part time in any private/ Government institutions. Private practice is forbidden during this period.

b) Each year shall be taken as a unit for calculating attendance.

c) Every student shall attend all the academic activities as prescribed by the department and not absent himself / herself from work without valid reasons.

d) The performance of the student will be periodically assessed by department HODs. Theory & Practical evaluation will be done every six months by the department HODs and will be informed to Principal’s Office. The ‘Soft Skills’ course will be assessed through 360 degree evaluation.

e) A candidate can avail a total 20 days leave, but not more than 10 days at a stretch of all categories including conference leave in a calendar year, with the permission of the HOD. Leave will be prorated according to the date of commencement of the course.

f) 15 days study leave will be given before the beginning of the final examination (as per the College Council Meeting decision). Additionally, study leave may be taken upto 2 weeks at the end of the course, provided there is sufficient leave in credit and with the permission of HOD. Under normal circumstances, leave of one year may be carried forward to the next year up to 2 weeks.

g) Exceptional cases, like prolonged illness or any meritorious grounds, the leave across the training programme may be clubbed together.

h) Any other leave other than the above is not permissible and shall lead to the extension of the course.

i) Every candidate is required to attend a minimum of 80% of the training during each academic year of postgraduate course.

j) Any candidate who fails to complete the course in the manner started above shall not be permitted to appear for the University Examination.

k) Ladies are eligible for Maternity leave of 72 days. They will not be eligible for stipend during this period. They have to work on all Sundays and Hospital Holidays to compensate the maternity leave and they will not be eligible for casual leave in that year.
l) A postgraduate student would be required to present one poster, to read a paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his/her postgraduate studies so as to make him/her eligible for the postgraduate degree examination.

(Performa of log book)

AMRITA VISHWA VIDYAPEETHAM
UNIVERSITY

DEPARTMENT OF ………………………

AmritaSchool of Medicine,
Amrita Institute of Medical Sciences
AIMS Ponekkara P.O,
Kochi - 682041, Kerala, India.

LOG BOOK

Name of the candidate:
AMRITA VISHWA Vidyapeetham
University

Department of ………………………

Amrita School of Medicine,
Amrita Institute of Medical Sciences
AIMS Ponekkara P.O,
Kochi - 682041, Kerala, India.

LOG BOOK

Name of the candidate : 
University Reg. No :
This is to certify that the content of log book is a bonafide work of __________________________
Reg. No. _______________ MD/MS/Diploma student in Department of ___________________________, Amrita School of Medicine, Amrita Institute of Medical Sciences & Research Centre for the Academic year _________ to _________.

Head of the Department
# RECORD OF PG COURSE

1. Name of the candidate: 
2. Registration No.: 
3. Name of Institution/Hospital: Amrita School of Medicine
4. Name of University: Amrita Vishwa Vidyapeetham
5. Duration of the Course: 
6. Address: AIMS- Ponekkara, Kochi, Kerala-682 041
7. Department: 

Signature of Principal

Signature of HOD

Date:

Place: Kochi, Kerala
# Bio-data

**Name** : 

**Permanent Address** : 

**Education**

<table>
<thead>
<tr>
<th>Course</th>
<th>College</th>
<th>Period</th>
</tr>
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<tbody>
<tr>
<td>MBBS</td>
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<tr>
<td>Diploma</td>
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<tr>
<td>PG Degree</td>
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**Subject** : 

**Date of Joining** : 

**Provisional Reg.No** : 

**Thesis Research Title** : 

**Signature**
DEPT. OF FORENSIC MEDICINE & TOXICOLOGY
EVALUATION FORM – P.G. PRESENTATIONS

Topic : 
Name of the Resident: 
Name of the Faculty: 

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Item Assessed</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Whether adequate number of relevant publications were cited/consulted?</td>
<td></td>
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<tr>
<td>2</td>
<td>Whether adequate number of relevant reference sources were cited/consulted?</td>
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<tr>
<td>3</td>
<td>Whether any other advanced reference sources were cited/consulted?</td>
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<td>4</td>
<td>Whether all aspects of the topic were covered?</td>
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<tr>
<td>5</td>
<td>Whether questions on fundamental or basic aspects of the topic were answered satisfactorily?</td>
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<tr>
<td>6</td>
<td>Whether questions on higher aspects of the topic were answered satisfactorily?</td>
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<td>7</td>
<td>Whether homework allotted has been cleared?</td>
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<tr>
<td>8</td>
<td>Whether AV aids were used appropriately?</td>
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<td>9</td>
<td>Whether the presentation was clear and articulate?</td>
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<tr>
<td>10</td>
<td>Whether the time management was appropriate?</td>
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Remarks if any

Total Score
(Tick the appropriate box below based on the total score)

<table>
<thead>
<tr>
<th>Poor (0-3)</th>
<th>Average (4-5)</th>
<th>Good (6-8)</th>
<th>Excellent (9-10)</th>
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Signature (s):
Amrita School of Medicine

Performa for assessment of PG residents (Diploma, Degree & Superspecialty)

(Period: _____________________  Batch: _____________________)

Name of the Resident : 
Course & Subject : 
Semester :

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Max Marks</th>
<th>Marks scored</th>
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</thead>
<tbody>
<tr>
<td>1. End Semester examination</td>
<td></td>
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</tr>
<tr>
<td>• Theory</td>
<td>25</td>
<td></td>
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<tr>
<td>• Practical / Clinical</td>
<td>25</td>
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<tr>
<td>2. Day to day Performance (Attitude / Sincerity, Clinical skills /</td>
<td>20</td>
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<tr>
<td>Practical Skill, Team spirit, Punctuality, Obedience)</td>
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<tr>
<td>3. Progress of Dissertation work/ Research activities</td>
<td>10</td>
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<tr>
<td>4. Publications / Poster Presentations/ Extension activities like</td>
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<td></td>
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<tr>
<td>Medical camps/ Social activities</td>
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<td>5. Teaching &amp; Academic activities (Seminars, Symposium &amp; Teaching of</td>
<td>10</td>
<td></td>
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<tr>
<td>Undergraduates)</td>
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OVERALL SCORE (Out of 100)

Suggestions for Improvements:

Unit Chief 
Head of the Dept.

To : The Principal
CC : Resident