

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR



P.G. DIPLOMA IN FORENSIC SCIENCE AND RELATED LAW

SCHEME OF EXAMINATION AND SYLLABUS

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
Syllabus for P.G. Diploma in Forensic Science and Related law

O -----:- Title of the Course: - P.G. Diploma in Forensic Science and related law

O -----:- Eligibility: Bachelor Degree in Science, Law, Medical Sciences, and Pharmacy
Candidates from other than Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur will have to obtain eligibility certificate from this University.

R ----- :- Duration of the Course: - One Year (Full Time.)

R ----- :- Fee Structure: - As Per the State Government Rules

R -----:- Intake Capacity - 40

R -----:- Teacher Qualifications: - As per the U.G.C. / State Government Norms and Experts from Forensic Science Field and Related Industry with minimum 3 years of experience.

R ----- :- Standard of Passing:-

- a. Candidate who secures minimum 35% in each subject/paper be declared to have passed the examination.
- b. A candidate who fails to secure 35% in a subject/Paper will be allowed to reappear in that subject/paper c. Candidate can carry forward at his/her option the marks in the subject/paper in which he/she has passed, in such a case student is entitled for award of class.
- c. Candidate who secures a minimum of 35% marks in each paper and an aggregate of 60% and above marks on the whole shall be declared to have passed the examinations in the First Class.
- d. Candidate who secures a minimum of 35% marks in each paper and an aggregate of 70% and above marks on the whole shall be declared to have passed the examinations with Distinction.

Medium of Instruction: English

Visit at Forensic Science Laboratory/other Laboratories

Syllabus for P.G. Diploma in Forensic Science and Related law

Course Structure

PAPER	TITLE OF PAPER	MARKS	LECTURES (1 hr. duration)
I	Basics of Forensic Science & Crime Scene Management	100	90
II	Forensic Science and its Application in Crime Investigation	100	90
III	Emerging Trends in Forensic Science	100	90
IV	Criminal Justice System and the Laws	100	90
V	Practical Training	100	90
VI	Project Work	100	90

Syllabus for

P.G. Diploma in Forensic Science and Related Law (PGDF)

Paper I: Basics of Forensic Science & Crime Scene Management

Paper II: Forensic Science and its Application in Crime Investigation

Paper III: Emerging Trends in Forensic Science

Paper IV: Criminal Justice System and the Laws

Paper V: Practical Training

Paper VI: Project Work

Paper I
BASICS OF FORENSIC SCIENCE & CRIME SCENE MANAGEMENT

(Total Marks 100)

Unit I: Forensic Science

Introduction, definition, Basic Principles, History & Development of Forensic Science, Scope and need of Forensic Science. Case studies related to principles of Forensic Science. Definition of Crime, elements of crime, Various types of crime, Criminal behavior-cause and theories, Modus Operandi, Criminal profiling, Corpus Delicti. Role of investigating officers, scientific officers, Importance of scientific report, ethics in Forensic Science. Role of Police officers, medico-legal doctors. Expert Testimony

Unit II: Crime Scene Management

Defining the Scene of Crime, Crime Scene Management & its hierarchy, Role of First Responding Officers, Search Patterns of a crime scene, Crime scene Documentation, Collection, Packaging, Labeling & Forwarding of exhibits to Forensic Laboratories., Preservation of evidence, Health & Safety Protocols.

Unit III: Evidences

Crime Scene Evidences- Fingerprints and other prints, Blood, Semen & other Biological fluids, Viscera, Shoe impressions, Tool marks, Tyre marks, Bite Marks, Hair – Animal & Human, Fibers & Fabrics, Glass, Soil, Pollens, Paint, Establishment of Identity of Individuals, Fingerprints/Footprints, Forensic Anthropology – Skeletal Remains, Forensic Odontology.

Unit IV : Forensic Science Laboratory

Brief History & current scenario at National & International level, Role and Functions of DFSS, Services and functionalities provided by various FSLs, Structure of the FSLs, Various divisions in the FSL – General Analytical and Instrumentation, Ballistics, Biology, Chemistry Documents, Physics, Psychology, Serology, Toxicology, Cyber Forensic, Tape Authentication and Speaker Identification (TASI), DNA division. Mobile Forensic Science Laboratories. Forwarding of evidences to Forensic Laboratories. Educational setup of Forensic Science in India.

Paper II

FORENSIC SCIENCE AND ITS APPLICATION IN CRIME INVESTIGATION

(Total Marks 100)

Unit I: Fingerprints and Questioned Document

Ten-digit fingerprint, Classification of Fingerprints, Minutiae Identification and Matching. Questioned Documents- definition, types and their analysis. Handwriting and signature-analysis, identification and examination, Procedure for examination, Types of Forgery, Anonymous letter, Charred document, Indented writing.

Unit II: Forensic Ballistics and Fire Scene Analysis

Firearms & Their Classification, Ammunition, Projectiles, Mechanism of Firing, Bullet, Weapon & Cartridge case Identification, GSR-Detection and analysis, Nature of Injuries – Entry & Exit wounds, range of fire by shotgun, rifles and pistol. Primary causes of vehicular accidents, analysis of accidents and hit and run crime scene.

Fire Scene Investigation-Analysis & Interpretation of fire scenes, Fire Dynamics, Detection of Ignitable liquid residues in fire scenes, Fire Debris Analysis & Analytical Methods for detection & characterization

Unit III: Chemical & Toxicological Analysis

Introduction to poison, definition, classification of poisons, Drugs of Abuse & Narcotic drugs, Toxicological examination of poisons (opium, datura, cannabis sativa, cannabis indica, barbiturates, plant poisons, cocaine, and alcohol) Collection of Viscera and separation technique of viscera. Analysis of poisons. Petroleum Products. Food Adulteration and their detection. Definition of Explosion & Detonation, Chemistry of explosives, some common explosives, Improvised Explosive Devices (IEDs), Disposal, Handling, Precautions and analysis.

Unit IV: Forensic Linguistics

Forensic Linguistics, Definition, Branches of Forensic Linguistics, Forensic Speaker identification- Introduction inter speaker and intra-speaker variation, forensic Phonetics-acoustic and auditory parameter, vocal tract, speaker recognition-identification and verification, spectrograph.

Paper – III

EMERGING TRENDS IN FORENSIC SCIENCE

(Total Marks 100)

Unit I: Forensic Medicine

Injuries: classification, forms and medico legal aspects. Post mortem examination, Estimation of Time since Death and Cause of Death. Medico Legal Aspects – Medico-legal Certificate, Post Mortem Report, Dying Declaration & Expert Testimony. Roles, responsibilities and conduct of an 'Expert'.

Unit II: Sexual Offences & DNA Fingerprinting

Sexual Offences - Rape, DFSA (Drug Facilitated Sexual Assault), Examination of the victim & the accused, Collection of evidence. Guidelines for the examination and interview of the survivors. Methods of Infanticide, Abortion, Artificial Insemination and their examination.

DNA-Introduction, source of DNA in Forensic case work, Extraction of DNA, Techniques of DNA fingerprinting-RFLP, STR, PCR. DNA fingerprinting in paternity disputes, mass disaster and other forensic case work, legal issues in DNA fingerprinting, case study.

Unit III: Advance Methods of Interrogation

Narco-Analysis: theory, forensic significance of narco-analysis, admissibility in court, future prospects, case study. **Brain Mapping**- introduction, EEG, P-3000 wave, brain mapping in Forensic Science, Limitation of technique, admissibility in court, case study. **Polygraph**: Principle and technique polygraph as forensic investigative tool, NHRC guidelines for polygraph test, case study. Other modern methods.

Unit IV: Emerging Trends & Instrumentation in Forensic Science

Introduction to Preventive Forensic, Forensic Journalism, Forensic Auditing and Virtual Autopsy. Forensic Significance of Gas chromatography, UV-Visible spectroscopy, IR spectroscopy, FTIR, HPLC, Microscopy- Compound Microscope, Stereo-Zoom Microscope, Comparison Microscope, SEM, TEM.

Paper IV
CRIMINAL JUSTICE SYSTEM AND THE LAWS

(Total Marks 100)

Unit I: Crime & Criminal behavior

15lectures

Definition of Crime, Various types of crime, Criminal behavior- Causes of criminal behavior, Theories of criminal behavior, Theories of punishment, Modus Operandi, Criminal profiling, Corpus Delicti.

Unit II Criminal Justice System

15 lectures Important

wings of criminal justice system- Police, prosecution & judicial officers. Role of Forensic scientists and medico-legal doctors in criminal investigation. Important Provisions of Code of Criminal Procedure- FIR, Complaint, Sec. 291, 292, 293, Framing of Charges, Bailable and Non-Bailable offence, cognizable and non-cognizable offence, summons, warrant, Investigation, inquiry and trial. Important Provisions of Indian Evidence Act, 1872- Section 32, 45, 46, 47, 57, 58, 60, 65, 65B, 73, 135, 136, 137, 159. Important Provisions of Indian Penal Code, 1860- Definitions, General Exceptions, Relevant provisions. IPC 302, 304, 306, 307, 309, 375, 376, 377, 498 and Cr PC 174. Medico Legal Aspects – PM report, Dying Declaration & Expert Testimony.

Unit III: Sexual offences and Law

15 lectures

Sexual Offences - Rape, Recent Amendments in Rape Laws, Drugs Facilitated Sexual Assault, Examination of the victims of rape & the accused, Collection of evidence in cases of Infanticide, Abortion, Artificial Insemination. Medical Termination of Pregnancy Act 1971; Prenatal Diagnostic Technique Act 1984.

Unit IV: Special Laws

15 lectures

Mental Healthcare Act 2017; Food Safety and Standards Act, 2006; Narcotic Drugs and Psychotropic Substances Act 1985; Prevention of Illicit Trafficking in NDPS Act 1988; Prevention of Damage to Public Property Act 1984; Arms Act 1959; Explosive Substances Act 1908; The Drugs and Cosmetics Act 1940; Small coins (offence) Act 1971; Standards of Weight and Measures Act, 1976; Information Technology Act, 2000 with recent amendments. Forensic Science Laboratory Maharashtra Civil Medical Code (Chapter 13),

Paper V

PRACTICAL TRAINING

(Total Marks 100)

1. Mock Crime Scene Investigation (Indoor/Outdoor)
2. Sketching the Crime Scene using Triangulation method.
3. Collection, packaging and forwarding of evidences collected from the crime scene.
4. Taking Plain Prints and Rolled Prints.
5. Taking 10-digit Fingerprint and Classifying them.
6. Thin Layer Chromatography for differentiation of Inks/drugs.
7. Examination of foot/footwear/tire impressions.
8. Latent print development using Powder methods.
9. Latent print development using Fuming methods.
10. Handwriting identification based on class characteristic and individual characteristics.
11. Microscopic examination of Animal and Human Hair.
12. Microscopic examination of Fibers.
13. Microscopic examination of Pollens.
14. Microscopic examination of Diatoms.
15. Preliminary examination of Blood.
16. To study the Principle, working and Forensic Applications of:
 - TLC
 - Electrophoresis
 - High Performance Liquid Chromatography
 - Gas Chromatography
 - UV-visible Spectrophotometer
 - Video Spectral Comparator
 - Electro-Static Detection Device/Apparatus

Paper VI

PROJECT WORK

(Total Marks100)

The project should be based on any topic based on the subjects related to the syllabus. The project report submitted by the student will be evaluated jointly by internal and the external examiner during the practical examination. The distribution of marks will be as follows:

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|--------------------------|----------------|
| 1) Project Report | 60marks |
| 2) Presentation | 20marks |
| 3) Viva-Voice | 20marks |

Recommended List of Books:

1. Henry Lee's Crime Scene Handbook by Henry C Lee
2. Forensic Biology by Shrikant H.Lade
3. Crime Scene Processing and Laboratory Work Book by Patric Jones
4. Forensic Science: An Introduction to Scientific and Investigative Techniques 3rded. by Stuart H.James
5. Criminalistics: An Introduction to Forensic Science, 9thed. By Richard Saferstein
6. Compute Crime and Computer Forensic by Dr. R.K.Tiwari
7. Criminal Profiling: An Introduction to a Behavioral Evidence Analysis, 3rded. By Brent E.Turvey
8. Forensic Science in Criminal Investigation and Trial, 4thed. By B.R.Sharma
9. Handbook of Forensic Psychology Dr.Veeraraghavan
10. Crime Scene Management with Special Emphasis on National level Crime Cases by Dr. Rukmani Krishnamurthy under publishing
11. Text Book of Medical Jurisprudence, Forensic Medicine and Toxicology by Parikh C.K.
12. Bare Acts (As per the need of the syllabus)