

ANNEXURE IV

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

Field Visits at Forensic Science Laboratory

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	Forensic Medicine and the Laws	100	90
IV	Recent Advances in Forensic Science 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

Paper I: Basics of Forensic Science & Crime Scene Management

Paper II: Forensic Science and its Application in Crime Investigation

Paper III: Forensic Medicine and the Laws

Paper IV: Recent Advances in Forensic Science 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

Crime & Criminal behavior **15**

lectures

- Definition of Crime
- Various types of crime
- Criminal behavior-cause and theories
- Modus Operandi
- Criminal profiling
- Corpus Delicti.

Unit II

Criminal Justice System **15**

lectures

- Important wings of criminal justice system
- Its structure & functioning,
- Role of Police officers, prosecution & judicial officers.
- Role of Forensic scientists, medico-legal doctors.
- Expert Testimony

Unit III

Forensic Science **15**

lectures

- Basic Principles & Significance
- History & Development of Forensic Science
- Organizational structure of Forensic Science labs in Central & State.

Unit IV

Crime Scene Management **15 lectures**

- Defining the Scene of crime
- Managing a crime scene & its hierarchy
- Role of First Responding Officers
- Search Patterns of a crime scene
- Crime scene Documentation
- Collection, Packaging, Labelling & Forwarding of exhibits to forensic laboratories.
- Preservation of evidence
- Health & Safety Protocols

Paper II: FORENSIC SCIENCE AND ITS APPLICATION IN CRIME INVESTIGATION

(Total Marks 100)

Unit 1: Definition, Nature, Need & Scope of Forensic Science. 15 lectures

- Crime Scene Evidences
 - Blood, Semen & other Biological fluids
 - Viscera
 - Shoe impressions, Tool marks, Tyre marks
 - Bite Marks
 - Hair – Animal & Human, Fibres & Fabrics
 - Glass, Soil, pollen Paint
- Establishment of identity of Individuals
 - DNA
 - Fingerprints/Foot prints
 - Anthropology – Skeletal Remains
 - Odontology

Unit 2: Questioned Document and Their Identification 15 lectures

- Identification of objects by shape and size
- Handwriting and signature-analysis, identification and examination
- Procedure for examination
- Types of forgery
- Anonymous letter
- Charred document
- Idented writing
- Counterfeit coins and notes
- Small coins (offence) Act 1971
- Standards of Weight and Measures Act 1976

Unit 3: Forensic Ballistics and vehicular accident reconstruction 15 lectures

- 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 and factors affecting it
- Primary causes of vehicular accidents
- analytical tools to evaluate accidents

Unit 4: Chemical & Toxicological Analysis

15 lectures

- Drugs of Abuse & Narcotic drugs
- Toxicological examination of poisons & alcohol
- Toxicological examination of Viscera
- Petroleum Products
- Food Adulteration
- **Explosives**
 - Definition of Explosion & Detonation
 - Chemistry of explosives
 - Home-made bombs & Improvised Explosive Devices (IEDs)
 - Disposal & Handling
- **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 & characterisation

Paper – III: FORENSIC MEDICINE AND THE LAWS

(Total Marks 100)

Unit 1: Medical Jurisprudence **15 lectures**

- Brief History & current scenario at National & International level
- Forwarding of Biological samples to Forensic Laboratories

Unit 2: Medico legal aspect of Death **15 lectures**

- Concept of Human Anatomy & Physiology
- Time of Death
- Causes of Death
- Injuries: classification, forms and medico legal aspects
- Medico Legal Aspects – PM report, Dying Declaration & Expert Testimony (Evidence Act)

Unit 3: Sexual offences **15 lectures**

- Sexual Offences - Rape, DFSA (Drug Facilitated Sexual Assault)
 - Examination of the victim & the accused
 - Collection of evidence
- Infanticide, Abortion, Artificial Insemination
- Medical Termination of Pregnancy Act 1971
- Prenatal Diagnostic Technique Act 1984

Unit 4: Legal Aspects **15 lectures**

- Mental Health Act 1987
- Prevention of Food Adulteration Act 1954
- NDPS Act 1985
- Petroleum Act 1934
- Prevention of Damage to Public Property Act 1984
- Prevention of Illicit Trafficking in NDPS Act 1985
- Arms Act 1950
- Explosives Act 1984
- Explosive Substance Act 1908
- The Drugs Act 1940
- The Drugs and Cosmetics Act 1945

Paper –IV: RECENT ADVANCES IN FORENSIC SCIENCE AND THE LAWS

(Total Marks 100)

Unit I

15 lectures

Cyber crime: definition, hacking, virus, obscenity, pornography, software piracy. It Act, 2000 .Intellectual property right-domain name, Trademark. Computer security-encryption, decryption and digital signature.

- **Forensic Speaker identification**-Introduction inter speaker and intra-speaker variation, forensic Phonetics-acoustic and auditory parameter, vocal tract, speaker recognition-identification and verification, spectrograph. Study of extortion threatening calls, hoax calls, drugs transactions and the recorded voice.

Unit II

15 lectures

- **Narco analysis:** theory, forensic significance of narco-analysis, admissibility in court, future prospect, 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.

Unit III

15 lectures

- **Facial reconstruction:** Method and technique, facial reconstruction in forensic identification.
- **Preventive Forensic:** To urge Government to impose rules or ban certain activities in the interest of Public Safety and avert many of natural and man made disasters.
- **Analytical methods:** Gas chromatography, UV-Visible spectroscopy, IR spectroscopy, FTIR, HPLC.

Unit IV

15 lectures

- ***Forensic DNA Finger Printing:***

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.

Paper V: Practical Training

(Total Marks 100)

(90 lectures)

- TLC method for differentiation of ink, drugs
- Examination of foot/footwear/tyre impressions
- Fingerprint development from various surfaces
- Handwriting identification based on class characteristic and individual characteristics
- Microscopic examination of
 - Hair
 - Fibre
 - Pollen
 - diatom
- Examination of various biological samples
 - Blood
 - Urine
 - vomit
- Demonstration and quantitative use of analytical instruments in crime investigation.
 - HPLC,
 - GC-MS
 - UV-visible Spectrophotometer
 - VSC
 - TLC
 - Electrophoresis,

Paper VI: Project Work (Total Marks 100)

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:

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

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 3rd ed. by Stuart H. James
5. Criminalistics: An Introduction to Forensic Science, 9th ed. By Richard Saferstein
6. Compute Crime and Computer Forensic by Dr. R.K. Tiwari
7. Criminal Profiling: An Introduction to a Behavioral Evidence Analysis, 3rd ed. By Brent E. Turvey
8. Forensic Science in Criminal Investigation and Trial, 4th ed. By B.R. Sharma
9. Handbook of Forensic Psychology Dr. Veerraghavan
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.