

**Department of Anthropology**  
**University of Delhi**  
**Syllabus 2023-24**  
**Certificate Course in Forensic Science (C.C.F.S)**

**Paper I: Anthropology of Crime & Criminology**

**(4 Credits)**

**Unit 1: Anthropology of Crime**

- I. Anthropological Theories of Crime and Delinquency. Socio-economic and Political motives
- II. Ethnographies of crime: examples of Criminals: Cross-cultural perspective, Observation and Crime Scene Reconstruction, Ethnographies of Prisons
- III. Crime and Custom in Traditional Societies
- IV. Nature of Reward and punishment,
- V. Customary Law: Mode of Dispute Resolution

**Unit 2: Criminology**

- I. Criminology: Aim, Scope and Historical development
- II. Definition of Crime: Theories and Perspectives
- III. Criminal Psychology
- IV. Environment, Criminal Behaviour and Profiling
- V. Victimology & Victim Assistance and Welfare laws for the Victims

**Unit 3: Criminal Law:**

- I. Penal Law and Procedure in India: (Indian Penal Code or IPC 1860); Criminal Procedure Code or CrPC 1973; Indian Evidence Act, 2023
- II. Police Administration in India
- III. Other Legal Investigating Authorities (Excise, Health, Food, Customs etc.) under different acts of India and their working and scope.
- IV. Role of Forensic Scientists in Criminal law. NDPS, IT ACT, CrPC, IPC, IEA, Forensic related laws
- V. Presentation of scientific evidence in courts and its legal acceptance.

**Unit 4: Investigating and Law Enforcing Agencies:**

- I. Role of Police and relationship of Police with Forensic Scientists, Police Investigation Procedures
- II. Types of Police Organization and its functioning, Delhi Police and its training programmes
- III. Crime investigation involving functioning of Dog squad and allied scientific aids.
- IV. Role of Excise and Custom Authorities in prevention of crime.
- V. Maintenance of crime records; Fingerprint Bureau and Modus Operandi Bureau, Digitization of Crime records

### **Unit 5: Crime Scene investigation and Analysis**

- I. Understanding the Crime Scene analysis and modus of operandi
- II. Types of crime scene, responsibility of first responder, securing & protection of crime scene,
- III. Types of search pattern and techniques, documentation of crime scene (sketching, note-taking, photography and videography)
- IV. Collection, preservation, packaging and transportation of various evidences
- V. Chain of custody, reconstruction, report writing & expert testimony
- VI. Crime cases and Evidences: procedure of acceptance, Examination and reporting by forensic science laboratories in India.

### **Practical: Paper I: Anthropology of Crime and Criminology**

**(2 Credits)**

- i. Study of organizational structure of investigation agencies (Police & Forensic Science laboratory).
- ii. Investigation & reconstruction of crime scene.
- iii. Method of Collection and Packaging of Crime evidences on Spot
- iv. Moot Court: Presentation of Evidence in court

## **Paper II: Fundamentals of Forensic Science**

**(4 Credits)**

### **Unit 1: Introduction**

- I. History, scope and relevance of Forensic Science
- II. Laws and principles and branches of Forensic Science
- III. Organisational structure of Forensic Science Laboratory in India
- IV. Emergence of Forensic Science in University set-up
- V. Scientific Discourse in Forensic Science: Contemporary

### **Unit 2: Forensic Chemistry & Toxicology**

- I. Methods of chemical analysis for alcohol, food adulterants, explosives, and inflammable solvents.
- II. Types of Poisons (corrosive, irritants, systemic and agrochemical) and their origin (Plants & Animal based), Effect on Physiology and its analytical examination
- III. Substance abuse (narcotics, hallucinogens, depressants, stimulants, anabolic steroids) and their analytical examination.

### **Unit 3: Forensic Biology, Serology and DNA Profiling**

- I. Composition and identification of blood and determination of species of origin and human blood types.
- II. Detection and study of different biological evidence: Semen, vaginal secretion, sweat, vomit, faecal matter, saliva, and urine.
- III. Forensic significance of hair, pollens, and diatoms.
- IV. Analysis and interpretation of DNA profiling.

### **Unit 4: Forensic Anthropology and Personal Identification**

- I. Personal identification through Somatometry and Somatoscopy
- II. Human Growth & Development
- III. Forensic Morphometry of Skeletal Remains
- IV. Bone Pathology and Forensic Odontology
- V. Use of occupational marks, tattoo marks and cultural symbols in Personal Identifications
- VI. Folkways and Habitus as Identity markers

## **Unit 5: Forensic Medicine & Entomology**

- I. History, Scope and set-up of medical jurisprudence.
- II. Establishing identity of living and the dead person.
- III. Mode and manner of death, Post-mortem changes after death, determination of Time Since Death
- IV. Medico-legal aspects of injuries (Blunt force, sharp force and regional injuries)
- V. Medico-legal aspects of death (asphyxial, thermal, starvation, infanticides and foeticide)
- VI. Medico-legal examination of Sexual offences
- VII. Role and importance of insects in determination of time since death

## **Practical Paper II: Fundamentals of Forensic Science**

**(2 Credits)**

- i. Identification and analysis of chemical evidences (poisons/ alcohol/ explosive residues/ narcotics/ drugs) by chemical tests.
- ii. Identification of common adulterants in petrol, diesel, kerosene, and foods (Spices, fats and oils) using colour test and analytical methods.
- iii. Preliminary and confirmatory tests for detection of blood, semen, saliva, urine and vomit.
- iv. Blood grouping from dried and fresh blood stain.
- v. Macro & Microscopic examination of human and non-human hair.
- vi. Microscopic examination of diatoms & pollens.
- vii. Interpretation of DNA STR Electropherogram
- viii. Morpho-metrical analysis of long bones and skull and calculation of indices.
- ix. Sex determination from skull and pelvis and age estimation from skull.
- x. Stature estimation from long bones.
- xi. Somatometric and Somatoscopic methods in personal identification.

## **Paper III: Advances in Forensic Science**

**(4 Credits)**

### **Unit 1: Forensic Physics & Instrumentation**

- I. Determination of material properties (glass, fibre, paint, and soil) and its forensic relevance and examination
- II. Matching of tool marks, tyre marks and Serial Numbers Restoration
- III. Description of Microscopy (light microscopy, electron microscopy)
- IV. Description of Spectroscopy (UV, IR, Atomic, Raman)
- V. Chromatography (TLC, LC, GC, GC-MS) and electrophoresis (Gel and Capillary)

### **Unit 2: Forensic Ballistics & Explosives**

- I. History & background of Firearms: classification and characteristics, components of ammunition and firearms, methods and types of rifling, country-made/imitative firearms
- II. Introduction to internal, external, and terminal ballistics.
- III. Forensic examination of bullet and cartridge cases and GSR, estimation of range of firing.
- IV. Classification and composition of explosives, mechanism and effect of explosion
- V. Types of explosive injuries, forensic evidences on explosive sites

### **Unit 3: Questioned documents**

- I. Idea of Question Document; methods of examination of questioned documents (documents, handwriting and signature)
- II. Characteristics of handwriting and its examination (Detection of forgery, examination of anonymous and disguised writing, detection of alteration)
- III. Examination of secret writing and charred document, estimation of age of documents
- IV. Methods & detection techniques of counterfeit currency, passports, cheques and stamp paper

#### **Unit 4: Forensic Dermatoglyphics and other impressions**

- I. Dermatoglyphics: morphogenesis of friction ridges, pattern types, classification of fingerprints
- II. Types of fingerprints found at crime scene: lifting collection and preservation of fingerprints
- III. Types of powder and chemical methods for development of latent fingerprints: Photography for comparison.
- IV. Examination of fingerprint (ridge characteristics and tracing)
- V. Significance of Poroscopy and Edgeoscopy
- VI. Relevance of lip prints, palm prints and ear prints.

#### **Unit 5: Digital Forensic & Cyber Crime**

- I. Definition and types of cyber crimes, cyber attack, CIA triad, cyber security and OWASP vulnerability, types of malware, investigations tools and techniques.
- II. Hardware & software of computer, types of storage media, pre-search preparation and action at the crime scene, Digital evidences
- III. Relevance and examination of Audio-video evidences
- IV. Approaches for speaker identification

#### **Practical: Paper III: Advances in Forensic Science**

**(2 Credits)**

- i. Physical matching of glass, direction and sequence of impact in glass fracture.
- ii. Examination of soil using microscopic, chemical and density gradient methods.
- iii. Microscopic examination of fibre, paint and tool marks impression.
- iv. Identification of different components of various firearms.
- v. Comparison of test and fired cartridge cases and bullets.
- vi. Filing of fingerprint on FBI card, pattern identification and classification system of fingerprints
- vii. Identification of ridge characteristics and comparison of questioned and suspected fingerprints.
- viii. Development of latent fingerprints by different powder and chemical methods and its comparisons by individual and class characteristics.
- ix. Examination of anonymous letters and disguised writing
- x. To detect and decipher alterations, secret writing and indentations marks in documents.
- xi. Comparison of handwriting samples with exemplars on the basis of class and individual's characteristics.
- xii. To examine the Forgery in currency notes, Passports and cheques.
- xiii. Identification of parts of computer including hardware and software.
- xiv. Recovery of data, copying and imaging, verifying integrity of file using hash calculator.
- xv. Audio, Video and image authentication. Software names: Video Cleaner, FiA 64 Image Authentication Software, Amped FIVE Medex Video Authentication Platform and Truepic
- xvi. Speaker identification using voice spectrograph. software name: Voice Inspector and BATVOX 3.0