Forensic Chemistry

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Forensic Chemistry	2	1	0	1	XIIth Pass with Science	NIL

Learning Objectives

- To introduce students to this fascinating branch of science and familiarize them with important concepts like fingerprints, explosives/arson, drugs and their detection.

Learning outcomes

After studying this course, the student will be able to:

- Describe latent fingerprints, various methods of detection of latent fingerprints, explosive analysis in forensic science, collection and preservation of evidence from crime scene etc

SYLLABUS
Theory:

Unit 1: History of Development of Forensic Science in India **2 hours**
Definitions, Scope and Need of forensic science, Ethics in forensic science, History of forensic science, Basic principles of forensic science, Organizational structure of forensic science laboratories, Different branches in forensic science

Unit 2: Fingerprints **5 hours**
Definition, History of fingerprint identification, Fingerprint as forensic evidence, Visible Finger marks, Latent Finger marks, ten-digit classification, Methods of Development of latent fingerprints using conventional methods–Powdering (Black and grey, fluorescent and magnetic), Methods of development of latent fingerprint using chemical method (iodine fuming, silver nitrate, Ninhydrin, Vacuum metal deposition), Automated Fingerprint identification system (AFIS), Poroscopy and Edgescopy

Unit 3: Forensic Chemistry **8 hours**
Scope & significance of Forensic Chemistry, Types of cases/exhibits received for analysis. Trap Cases: Collection, and Preliminary analysis of evidence in trap cases.
Alcoholic Beverages: Types of alcohols, country made liquor, illicit liquor, denatured spirits, Indian made foreign alcoholic and non-alcoholic beverages.
Dyes: Scope & Significance of dyes in crime investigation, analysis of ink by TLC and UV visible spectrophotometry. Petroleum products and their adulterations: Chemical composition of various

fractions of Petroleum Products, Analysis of petrol, kerosene, diesel.
Fire/Arson and Explosives Fire: Introduction to Fire & Arson, origin of fire, Chemistry of Fire, Fire tetrahedron,Firefighting operations, preservation of fire scene, collection of evidences, Seat of fire, cause of fire, motives, Analysis of fire debris, Case studies related to fire and Arson. Explosive and Explosion: Scope & significance of explosive analysis in forensic science, Types of explosives, deflagration and detonation, explosive trains, collection, preservation and forwarding of exhibits, preliminary analysis of explosives. Dos and Don'ts. Case studies related to explosives.
Drugs of abuse: Classification, including designer drugs. Ill effects of drugs of abuse, Preliminary and conformatory tests.

Practicals/ Hands-on Training **30 hours**

1. Development of fingerprint through conventional powder method.
2. Development of fingerprint through chemical methods.
3. To check the alcohol presence in different liquor.
4. Phenolphthalein test for trap cases.
5. Identification of Handwriting Individual Characteristics.
6. Study of Disguise in handwriting.
7. TLC of amino acids

Essential/recommended readings

- Saferstein, R. (1990) Criminalistics, Prentice Hall, New York.
- Basic Principles of Forensic Chemistry by JaVed I. Khan • Thomas J. Kennedy Donnell R. Christian, Jr.
- Fundamentals of FINGERPRINT ANALYSIS Hillary Moses Daluz
- Clarke's Analysis of Drugs and Poisons 3rd Ed.

Examination scheme and mode:

Evaluation scheme and mode will be as per the guidelines notified by the University of Delhi.