

Forensic Physics Syllabus

Section- C

Unit-1

Forensic Physics- Introduction, definition and scope. density, refractive index, birefringence; other optical properties of crystalline material. Brief idea on electromagnetic spectrum. General idea of instruments used in forensic physics like microscopy, spectroscopy, densitometer etc.

Unit-2

Examination of Building Material- Examination of building materials: types of cement and their composition, determination of adulterants by physical and instrumental methods, examination of brick, analysis of cement mortar and cement concrete.

Unit-3

Glass- Definition and nature, various types of glass, their composition and properties. Recognition, collection, preservation and forwarding of glass evidences. Examination of glass at the scene of crime and laboratory. Glass Fractures- types and characteristics. Forensic importance of glass fractures.

Soil- Nature and importance, composition of different soils. Recognition, collection, preservation and forwarding of soil sample for laboratory examination. Examination of soil in forensic science laboratory.

Unit-4

Paper- Composition, types of papers, examination of paper in laboratory.

Paint- Forensic importance, nature and main constituents of paint, types of paints. Examination of paint in the laboratory.

Fiber- Types, classification, laboratory examination of fibres, examination of rope, cord, string, metal fragments, dust and debris.

Metals- Analysis of seized metals and precious metals in laboratory.

Unit-5

Tool marks and Other impressions- Nature and importance in forensic science, types of tool marks. Factors influencing tool marks. Standard for comparison. Comparison of tool marks in laboratory. Casting of tool marks from different surfaces. Restoration of Erased marks on metal and wood.

Foot print, shoe print, tyre marks, skid marks and other similar impressions- Nature and importance in forensic science and their types. Preservation and comparison of these impressions on different surfaces.

Unit-6

Questioned Document- Preliminary examination of document. Exemplars for comparison of handwriting. Erasure, obliteration, and addition. Secret Writing. Decipherment of charred document. Forged writing and forged signature. Indented writing. Photography of questioned document.

Counterfeit Coins, Currency Notes etc. - Features of genuine currency notes of Indian origin as well as important foreign currency like US Dollar, Euro, Pound etc. Examination of counterfeit coins, currency notes and security stamps in Indian context.

Unit-7

Forensic Photography- Introduction to forensic photography, role of photography in forensic science, camera its parts and functioning, different types of camera and lenses, enlarger and other equipment's used in photography, developing and printing methods. Digital photography, specialized techniques used for documents, fingerprints, special photographic techniques; use of instant of photography, use of flash attachments, use of infrared photography, use of ultraviolet photography & alternative light source. General photographic responsibilities and videography.

Unit-8

Speaker Identification and Tape Authentication: Voice production theory-vocal anatomy, speech signal processing & pattern recognition- basic factors of sound in speech, acoustic characteristics of speech signal, fourier analysis, frequency & time domain representation of speech signal, analogue to digital signal and conversion, fast fourier transform, quantization, digitization and speech enhancement, analysis of audio-video signal for authenticity, introduction to the techniques of pattern recognition and comparison. General idea of different software used in voice identification.

Unit-9

Identification of Firearm- History and background of firearms, their classification and characteristics, various components of firearms, different systems and their functions, rifling, purpose of rifling, types of rifling, trigger and firing mechanism, cartridge-firing mechanism, projectile velocity determination identification of origin, improvised/country-made/imitative firearms and their constructional features.

types of ammunition, classification and constructional features of different types of cartridges, types of primers and priming composition, propellants and their compositions, various types of bullets and compositional aspects, smooth bore firearm projectile, identification of origin, improvised ammunition and safety aspects for handling firearms.

Unit-10

Computer Forensics-Definition, various types of computer crimes, collection, handling and preservation of digital evidences. Networking concepts, what is internet and technology behind internet, definition, crimes on internet, hacking, virus, worms, cookies, obscenity and pornography, program manipulation, software piracy and intellectual property. Concept of network security and cyber-crime investigation, relevant section of information technology act 2000 including amendments