1. General Forensic Science

Definition, nature and scope of forensic science, Principles of forensic science, Branches of forensic science, Role of forensic science in criminal justice system, Functions and organization of forensic science laboratories in India, Duties and responsibilities of forensic scientists, Ethical issues in forensic science, types of crime scenes, Principles of crime scene investigation, Methods of crime scene search, Documentation of crime scene, Recognition and classification of physical evidence, Collection, preservation and forwarding of evidence, Chain of custody, Reconstruction of crime scene, definition of documents under sec 2 BNS and Section 2(1)(c), 39(1), 41(1) and 72 of BSAand Sections 328 and 329 of BNSS

2. Forensic Document Examination

Scope & importance of Forensic Document examination: Nature & problems of Forensic Document Examination Classification of documents, Disputed/Specimen Admitted Care, handling, preservation of documents; Observation tests and their application in handwriting examination, Preliminary examination of case documents, Process of comparison of handwriting, Principle of handwriting examination; Importance of natural variations and disguise in hand writing examination: Holographic documents: Writing instruments, working of fountain pen, ball pen, gel pen, writing characteristics produced by them, Viscosity, Surface tension, Capillary rise, writing inks, writing surface, care, handling, preservation, packing and marking of documents - Dos and Don'ts in forwarding of documents. Physiology of handwriting, various writing features terminology and definitions, general characteristics of handwriting viz. speed, skill, pen pressure, alignment, line quality, slant, proportion of letters etc., and their estimation, individual characteristics of handwriting and their estimation. Natural variations in handwriting and its importance, disguise in writing cause and identification, comparison of like with like, process of comparison Examination of alphabets and numerals. Extrinsical and Intrinsical factors affecting handwriting. Influence of writing instrument and writing surface on handwriting Nature and types of forgeries, characteristics of genuine and forged signatures, their detection, identification of line quality, artificial and natural tremor, determination of age of documents by examination of signatures paper ink and writing/signatures etc., by spectroscopic and chromatographic methods and statistical technique. Examination of sequence of intersecting strokes, Addition of text with ink or typescript, Anachronistic features and their importance. Stabilization of charred documents-Decipherment of charred documents, Reconstruction of torn documents.

3. Printed/Photocopied/Scanned Documents

Types of computer printers, working of computer printers- dot matrix printers, ink jet printer, laser jet printers, thermal printers, digital offset printers, Identifying features of different computer printouts, methods of identification of toners and inks used in printing Examination and identification of digitally manipulated documents using computers and printers, principle and working of different conventional printing processes-letterpress, Lithographic and Gravure processes, offset printing, Intaglio Printing, Flexography printing, Thermography printing, Digital printing and Screen printing, Various type of security printing, Identifying features of the printed matter of various printing processes, examination of black and white and colour photocopies and their identifying features, process of collection of sample photocopies for the purpose of comparison, examination of fax message, scanned documents, carbon copies and carbonless copies, Difference between Photocopies, Computer Printouts and Scanned copies, concept of Digital signature.

4. Security Documents

Various types of Indian passports and visa and their security features, watermarks, Ghost/imitated image, Holograms, OVI ink, Thermal ink, History and development of banknotes in India, various types of printing of security documents, printing of currency notes, latest security features of new Indian currency notes, examination of counterfeit currency notes, passports, visa, stamp papers. Examination of the security features of plastic cards- credit cards, debit card, PAN card, Aadhaar card, smart card and other plastic cards, Holographic Documents.

5. Instrumentation

Microscopy, Properties of light, Refraction, Reflection, Principle and working of Microscope, Stereomicroscope, Stereo Zoom microscope, Comparison microscope, Advanced microscopy, Light Sources- UV, IR, transmitted, oblique light, spot light.

Spectroscopic techniques:- Basic concept of Spectroscopy, UV/Visible Spectrophotometer, absorption laws, Infrared (IR) Spectroscopy, Raman spectrophotometer, Mass Spectrometry, FTIR, Instrumentation techniques of Neutron Activation Analysis (NAA), Separation methods, TLC, GC for qualitative and quantitative analysis, electrophoresis, working principle & features of Comparators: spectral filters composition & their selection, long-pass & band-pass filters, absorption spectra, emission spectra, electrostatic charge development, Coulomb's law, Electric field, Electric Potential, Capacitance and Capacitor.

Photomicrography, Forensic Photography using scientific equipment, Photography of documents, Digital Photography and its applications, Juxtapose charts and demonstrative photographs.

Working principles and applications of DocuCenter, ESDA and High Resolution Video Spectral Comparators (VSC).

6. Handwriting and Signature Examination

Handwriting Examination Development of handwriting, master pattern, physiology of handwriting, different handwriting systems, matured/ immature writings, theory of probability. Definition of natural variations and disguise, Various methods adopted for disguise. Importance of natural variation and disguise in handwriting examination, Handwriting/signature examination principles of handwriting identification, General characteristics and their estimation-line quality, speed slant, shading, rhythm, size, skill, movement, alignment, relative size and proportion, pen lifts, pen pressure, pen position, pen pause, hiatus, commencing and terminal strokes, connecting strokes, Individual characteristics of handwriting and their estimation, rare/occasional and accidental features in handwriting, effect of posture, emotion, illness, age and drugs/alcohol on handwriting, identification of unaccustomed hand writing, Anonymous letters, Forensic stylistics effect of mother tongue on foreign script, examination and inter-se comparison/English alphabets and numerals, procurement of handwriting standards-specimens and contemporaneous writings, process of comparison of like with like, best standards for comparison with disputed documents, Serrated edges examination.

7. Forensic Document problems

Classification of Erasures: Chemical & Physical, detection and decipherment, techniques involved, detection and decipherment of addition alteration/obliteration in writing and printed documents, techniques and limitation involved. Sequence of strokes determination in similar and different inks & writing instruments. Examination of built-up documents. Examination and decipherment of indented writing Detection and decipherment of various alterations- obliterations, additions, overwriting, mechanical and chemical erasures and secret writings, simple forgery, traced forgery, simulated forgery, forgery by trickery, forgery by transplantation using scanners and colour printers, inherent signs of forgery. Detection and Decipherment of mechanical impressions - rubber stamp impressions, metallic seal impressions, embossed impressions, indentation marks

Examination of charred documents: preservation and examination techniques involved.

Chemistry of dyes and pigments, Luminescence, Fluorescence, Phosphorescence, types of paper and Inks, writings instruments, techniques used in the analysis of paper & inks, History of Ink, chemical composition of different types of ink, destructive and non-destructive techniques involved in identification of inks: spectral comparison, chemical separation techniques using TLC, HPTLC, GC. Relative and absolute age of ink, techniques involved. Invisible/ secret ink, thermal ink

8. NABL guidelines for accreditation of Forensic Science Laboratories, safety management in document laboratories

9. CHEMISTRY:

Concepts of Chemistry, States of Matter, Types of Intermolecular Forces, Classification of Matter into Mixture and Pure Substance, Properties of Matter, Structure of Atoms and Bond, Thomason's Model of Atoms, Rutherford's Model, Bohr's Model of Atom, Electronic Configuration, Characterization of Elements as Metal and Non-Metals, Nature and Behavior of Acid, Base and Salts, Introduction to Spectroscopy, its Types, Principles and Applications in Forensic Science, Introduction to Chromatography, Rf value, Adsorption, Partitioning, Types of Chromatography and their Application in Forensic Science.

10. PHYSICS:

Basic Concepts of Physics, Physical properties, Laws of Motion, Force, Gravitation, Work and Energy, Nature of Sound and its Propagation in Various Media, Reflection of Sound, Light as Electromagnetic Radiations and its Properties, Optics, Lenses, its Types and Application in Daily Life, Mirrors, Introduction of Microscopy - Numerical aperture, Resolving Power, Image Formation, and Types of Microscopes, its Types, Principles and Application in Forensic Science.