



KRISTU JAYANTI
(DEEMED TO BE UNIVERSITY)
Under Section 3 of UGC Act 1956
A CMI INSTITUTION | BENGALURU | INDIA

Centre for Research and Development
Office of Doctoral Studies

Syllabus for the Part B of
Kristu Jayanti University Entrance Test (KJUET)

Ph. D. Programme in Forensic Sciences

Unit I: Introduction to Forensic Science

Forensic Science : Definition, History & Development, Scope, Ethics in Forensic Science; Physical Evidence : Nature, Types, Search methods, Collection, Preservation, Packing & Forwarding of Physical & Trace evidence for forensic analyses, Chain of Custody; Crime Scene : Nature, Types, Preservation of Scene of Crime; Criminal Investigations : Unnatural deaths, Criminal assaults, Sexual offences, Poisoning, Vehicular accidents; Courts : Types, powers and jurisdiction, Admissibility of evidence in Courts, Definition of Experts, Court Procedures pertaining to Expert Testimony & Witness Forensic aspects of new laws: Bharatiya Nagrik Suraksha Sanhita (BNSS), Bharatiya Sakshya Adhiniyam (BSA), Bharatiya Nyay Sanhita (BNS); Organization of Forensic Science Laboratories : Centre and State, NCRB, NICFS; Fundamental Rights : Right of Equality (Articles 14 to 18), Right of Freedom (Articles 19 to 22) as per Constitution of India; Criminal Profiling : Profile of victim and culprit, Role in crime investigation, Lie detection (Polygraphy), Narco analysis, Brain mapping, Scope and limitations; Quality Control Management : Concept of quality control management in Forensic institutions, Importance of Accreditation of Forensic Science Laboratories.

Unit II: Instrumentation

Microscopy : Polarizing, Comparison, Stereoscopic, Fluorescent, Electron Microscopes; Spectrophotometry : UV, Visible, IR, Raman, Atomic absorption, Emission; Neutron Activation Analysis : Principle, Application; X-rays and X-ray Techniques : XRD, XRF; Mass Spectroscopy : Principle, Applications; Chromatographic Techniques : TLC, GLC, HPLC, HPTLC; Hyphenated Techniques : GC-MS, LC-MS, IR-MS, ICP-MS; Electrophoresis : High voltage electrophoresis, Low voltage electrophoresis, Immunoelectrophoresis; Immunoassays : Principle, Types, Techniques, Applications.

Unit III: Forensic Biology and Serology

Blood Stains : Detection, Identification; Species of Origin : Determination methods; Blood Group Systems : Types, Applications; Blood Grouping : Techniques of determination of blood groups of blood stains; Body Fluids : Detection of seminal and other body fluids, Blood grouping of body fluids, Red cell enzymes, Serum proteins of forensic significance; Disputed Parentage : Paternity testing, Maternity testing; DNA : Structure, DNA as genetic marker, DNA extraction techniques, DNA profiling techniques; DNA and RNA Profiling : DNA phenotyping, RNA profiling, Applications; Hair and Fibers : Nature, Types, Structure, Examination methods; Pollens and Diatoms : Applications in forensic investigation; Wildlife Forensics : Wildlife (Protection) Act 1972, Scope, Evidences, Identification.

Unit IV: Forensic Chemistry and Toxicology

Alcohol Analysis : Ethyl alcohol in beverages, liquors, biological fluids, breath; Methanol and Denaturants : Analysis methods; Illicit Liquors : Detection, Analysis; Trap Cases : Analysis of chemicals; Toxic Substances : Metabolism and chemical examination of insecticides, pesticides, tranquillizers, sedatives, hypnotics, stimulants, narcotics, opiates, drugs of abuse, Toxicity evaluation; Poisons : Plant poisons, Metallic poisons; Poison Examination : Extraction, Isolation, Clean-up procedures, Identification from viscera, tissues, body fluids; Fire and Arson : Analysis of petroleum products, Other incendiary materials; Explosives : Definition, Types, Analysis methods; Bombs : Country-made bombs, Improvised Explosive Devices (IEDs), Examination; Explosion and Arson Cases : Investigation methods; Photography : Types, Applications in criminal investigation, Forensic evidence examination.

Unit V: Forensic Physics and Ballistics

Dust and Soil : Nature, Types, Forensic examination; Paint, Lacquer and Varnishes : Nature, Composition, Forensic examination; Glass : Composition, Types, Fractures, Examination; Cement, Mortar and Concrete : General composition, Forensic analysis; Firearms : Types, Classification, Ammunition and their compositions; Firearms Examination : Firearms, Ammunition, Firearm projectiles (bullets, shots, slug), Shell case; Gunshot Residues : Analysis methods; Ballistics : Concept of velocity, Penetration, Dispersion, Ricochet, Accidental discharge, Determination of range in firearm cases; Country-made Firearms : Examination methods; Ballistics Types : Internal, External, Terminal ballistics basics; Tool Marks : Meaning, Types, Examination; Erased Markings : Restoration on metal surfaces.

Unit VI: Impressions and Digital Forensics

Fingerprints : History, Characteristics, Types, Classification, Preservation, Development, Lifting, Comparison, Chance prints examination, Computerization of fingerprints, AFIS; Track Marks : Foot prints, Shoe prints, Tire marks, Preservation, Casting, Comparison, Skid marks, Gait pattern; Biometric Systems : Identification systems, Relevance; Voice Analysis : Introduction, Significance, Human voice apparatus structure, Voice spectrography, Voice analysis methods, Legal aspects, Limitations; Computer Forensics : Introduction, Types of computer crimes, Digital evidence seizure, Acquisition, Forensic examination; Mobile Forensics : Mobile phone evidence collection, Examination.

Unit VII: Questioned Documents

Documents : Definition, Types, Preliminary examination; Document Reproduction : Photographic methods, Mechanical methods, Examination; Alterations : Erasures, Obliterations, Additions; Hidden/Altered Documents : Indentations, Secret writings, Charred documents; Inks and Papers : Scientific examinations, Modern methods; Document Dating : Age of documents; Printed and Typed Documents : Typescripts, Printed matter, Currency notes, Lottery tickets, Mechanical impressions; Handwriting : Class characteristics, Individual characteristics, Factors affecting handwriting, Standard samples for comparison, Comparison of texts; Handwriting Issues : Anonymous writings, Disguised writings; Forgery Detection : Handwriting identification, Signature verification, Forged signatures, Forgeries; Special Documents : Examination of credit cards, Similar materials.

Unit VIII: Forensic Medicine and Anthropology

Death : Modes, Manner of deaths, Sexual offences, Medicolegal importance, Legal amendments related to sexual offences; Post-mortem : Examination procedures, Post-mortem changes, Estimation of time since death; Injuries and Wounds : Types, Medicolegal importance, Gunshot wounds; Skeletal Remains : Determination of species of origin, Sex, Age, Stature, Individual identification; Identification Methods : Skull superimposition, Facial reconstruction; Dentition : Human dentition, Types of teeth, Age determination, Bite mark analysis; Forensic Entomology : Introduction, Insects of forensic importance, Insects on carrion, Forensic applications.