

SARDAR PATEL UNIVERSITY
Programme: MSC (Forensic Science)
Semester: IV
Syllabus with effect from: June 2011

| | |
|---|-------------------------|
| Paper Code: PS04CFSC02 | Total Credits: 4 |
| Title Of Paper: Forensic Biology & DNA Profiling | |

| Unit | Description in detail | Weightage (%) |
|----------|--|---------------|
| 1 | DNA PROFILING: history of DNA fingerprinting, Molecular biology of DNA, variations, polymorphism DNA typing systems- RFLP analysis, PCR amplifications, Sequence polymorphism, analysis of SNP, Y-STR, mitochondrial DNA, Evaluation of results, frequency estimation calculations, Interpretation, allele frequency determination, Match probability- database, quality control, certification, Forensic significance of DNA profiling. | 25 % |
| 2 | BODY FLUIDS/ STAINS AND TISSUES: Introduction to various types of body fluids and tissues- morphology, histology and functions, identification and examination of blood stain- physical, florescence, biochemical and microscopic examination, morphological structure of spermatozoa of human and animals. Confirmatory test for a spermic semen- p-30, identification of lochial and menstrual stains by microscopic, biochemical and Electrophoratic method, identification and examination of other body fluids/stains- vaginal, saliva, urine, pus, faeces, vomit, milk, sweat and tears etc. HAIR AND FIBRE: morphology and biochemistry of human and animal hair, and its microscopic examination, determination of origin race, sex, site. Types of fibers- forensic aspects of fibre examination- fluorescent, optical properties, refractive birefringence, dye analysis etc. identification and comparison of man-made and natural fiber. | 25 % |
| 3 | IMMUNOLOGY: Haptoglobins-various types, HLA. Polymorphic enzymes and their forensic significance. Immunology: immune system, immune response, innate and acquired immunity, antigens, heptanes and adjuvants, immunoglobulin- types, physio-chemical properties and function, raising of anti-sera, Lectins- their forensic significance, buffers and serological reagents, methods of sterilization employed for serological work. FORENSIC BOTANY: various types of wood, timber variants, seeds and leaves- their identification and matching. Diatoms- types, morphology, methods of isolation from different tissue and forensic importance of planktons especially diatom, forensic significance in drowning cases. Study and identification of pollen grains, identification of starch grains, powder and stains of spices etc, paper and paper pulp identification, microscopic and biochemical examination of pulp material etc., isolation, classification and identification of microbial organism. | 25 % |
| 4 | FORENSIC ENTOMOLOGY: general entomology, significance of terrestrial and aquatic insects in forensic investigations and their role in crime detection, insect's succession and its relationship to determine time since death. Impact of ecological factors on insect's developments. WILD LIFE FORENSICS: introduction and importance of wild life, protected and endangered species of animals and plants, wild life species- identification and examination of physical evidence by conventional and modern methods, identification of pug marks of various animals, census of wild life population. | 25 % |



Basic Text & Reference Books:

- Criminalistics: An Introduction to Forensic Science – Richard Saferstein.
- Crime Scene Management – M.S.Dahiya.
- Forensic Science in Criminal investigation – B.R.Sharma.
- Principles of Forensic Medicine including Toxicology – Nandi Apurba.
- Parikh's Textbook of Medical Jurisprudence Forensic Medicine – C.K.Parikh.
- Book of Biotechnology – B.D.Singh.
- Dealing with DNA Evidence – Semikhodskill A.
- Genetic Policing: The use of DNA in Criminal Investigation – Williams Robin.

