FORENSIC ANALYSIS OF BIOLOGICAL EVIDENCES

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the Course (if any)
		Lecture	Tutorial	Practical/Practice		
Forensic Analysis of Biological Evidences	2	0	-	2	XII Passed with Science	Nil

Course Objectives

The course aims to provide an understanding of the applications of biochemistry in forensic sciences through analysis of evidences, which will help students develop analytical and problem-solving skills for real life situation. The course will keep abreast with all recent developments and emerging trends in forensic science thus helping interested students take up forensic science as future course of study.

Learning outcomes

After completing the course students will be able to

1. Explain how a forensic investigation is initiated through preservation of evidences, as well as chemical, physical and biological methods of their analysis
2. Establish identity of an individual by serological evaluation, and DNA analysis.
3. Comprehend the importance of precision, reproducibility and accuracy in identification of a biological sample.
4. Evaluate and t identify the accurate age, sex and identity of an individual in skeletal remains in a forensic investigation.
5. Obtain hands-on-experience in some of the basic biochemical processes involved in forensic investigation.

Skill development and job opportunities

After completion of this course students would obtain the training in analysis of biological evidences. They will be encouraged to do short internships in forensic laboratories and research institutes. The students will also be able to take a job in forensic laboratories as they will know how to handle a forensic sample and do basic biochemical analysis

Unit I: Biochemical analysis of trace evidences (3 Weeks/ 12 Hours)

- Examination of Fiber and Soil
- Examination of Hair and Pollen

Unit II: Biochemical analysis of biological fluids as forensic evidence (3 Weeks/ 12 Hours)

- Preliminary and Confirmatory test for blood, semen and saliva and other biological fluids
- Blood group and blood protein analysis for identification of an individual
- Blood splatter analysis

Unit III: DNA Fingerprinting (4 Weeks/ 16 Hour)

- Extraction of DNA from biological samples (Blood/Semen/Saliva/Hair)
- DNA fingerprinting based on micro/mini satellite markers (PCR and Agarose gel electrophoresis)

Unit IV: Forensic Anthropology (2 Weeks/ 8 Hours)

- Determination of sex, age and ethnicity through skeletal remains
- Forensic odontology to determine age and identity of remains

Unit V: Field trip to a forensic laboratory and case study presentation (3 Weeks/ 12 Hours)

Teaching Methodology/Activities in the Classroom

Content presentations, virtual labs/videos, hands-on sessions and case study discussions

Assessment Patterns for Each Unit/Practical

Unit I: Assessment based on the results reported for the practical conducted (20 marks)

Unit II: Test on the topics covered (10 marks)

Unit III: Assignment for interpreting DNA fingerprinting results (15 marks)

Unit IV: Assessment based on the results reported for the practical conducted (10 marks)

Unit V: Case Study Presentation (10 marks)

Viva (5 marks)

Practical Record/File (10 marks)

ESSENTIAL READINGS

- James, S. H., Nordby, J. J. & Bell, S. (2014). *Forensic Science: An Introduction to Scientific and Investigative Techniques, Fourth Edition*: Taylor & Francis. ISBN 9781439853832
- Saferstein, R. (2018). *Criminalistics: An Introduction to Forensic Science, Twelfth edition*: Pearson Education. ISBN 10:0134477596, ISBN 13: 9780134477596
- Tewari, R. K., Sastry P. K., Ravikumar, K. V. (2002). *Computer Crime and Computer Forensic*, *First Edition*: Selective & Scientific Books
- Veeraraghavan, V. (2009). *Handbook of Forensic Psychology, First Edition*: Selective & Scientific Books

SUGGESTED READINGS

- Lee, H., Palmbach, T. & Miller, M. (2001). *Henry Lee's crime scene handbook, First Edition*: Academic Press ISBN 9780080507989
- Parikh, C. K. (2016). *Parikh's textbook of medical jurisprudence, forensic medicine and toxicology : for classrooms and courtrooms*, *Seventh Edition*: CBS Publishers and Distributors. ISBN 9788123926469