

GENERAL INSTRUCTIONS & COURSE CURRICULUM

**FOR
Add- on Courses**

**CERTIFICATE COURSE IN FORENSIC SCIENCE
(Effective from Session 2024-25)**



**DEPARTMENT OF FORENSIC SCIENCE
HIMACHAL PRADESH UNIVERSITY
(NAAC Accredited "A" Grade University)
SUMMERHILL, SHIMLA-171005, HIMACHAL PRADESH,
INDIA**

CHAIRMAN
Department of Forensic Science
Himachal Pradesh University

Certificate Course in Forensic Science

GENERAL INSTRUCTIONS/ GUIDELINES FOR EXECUTION OF CURRICULUM

- I. The Certificate course in Forensic Science will be of six months duration
- **Add-on Courses [AOC]:** A total of two AOC will be offered by the department. AOC of 2-credits includes the theory and practical component of 25 marks each
- NOTE:** The practical [PR] examination will carry 25 marks as follows.
- | | |
|---|------------|
| Performance and write-up of practicals: | 15.0 marks |
| Practical record/ Notebook: | 5.0 marks |
| Viva voce examination: | 5.0 marks |
- II. A candidate must secure minimum pass marks individually in Theory [TH] paper and Practical [PR] examination to earn full credits in the concerned course. A candidate thus failing in any of these components shall be considered to have failed that course.
- **A student will be awarded Certificate in Forensic Science after securing 4 credits.**
- III. The admission to this certificate course will be as per the university norms.

Outline of Certificate Course in Forensic Science

Course Code	Title of the Course	Marks		Total Marks	Credits T+P
		Theory	Practical		
FSAOC-1	Crime Scene Investigation (CSI)	25	25	50	1+1
FSAOC-2	Forensic Fingerprint Sciences	25	25	50	1+1
Total Marks/ Credits		50	50	100	2+2= 4

PROGRAM OUTCOME:

The certificate program in Forensic Science provides a comprehensive understanding of crime scene investigation, forensic questioned documents, and forensic fingerprint sciences. Through a blend of theoretical knowledge and practical experience, students will gain proficiency in crime scene management, evidence collection, and analysis of various types of evidence including biological, physical, and digital. The curriculum emphasizes the application of forensic principles in real-world scenarios, ensuring students develop the skills necessary for accurate documentation, analysis, and presentation of forensic evidence. Graduates will be equipped with the expertise to pursue careers in forensic science, contributing to the criminal justice system through meticulous investigation and ethical practice.

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COURSE: FSAOC-1
Crime Scene Investigation (CSI)

Theory: 15 Credit Hours
Practical: 30 Credit Hours

Theory examination: 25 marks
Practical examination: 25 marks
Total Marks: 50

NOTE: Instructions for setting question paper

The examiner will set a total of nine (9) questions covering the entire syllabus. Out of nine questions, Q. No. 1, containing five short-answer type questions that will cover the entire syllabus will be compulsory. There will be 4 questions from each section. Students will attempt five questions in total by selecting two questions from each section and the compulsory question. All questions shall carry equal marks (5 marks each).

SECTION- I

Unit 1: Introduction to Forensic Sciences and Crime Scene Investigation

Overview of Forensic Sciences-Introduction to forensic science and its role in criminal investigations; Historical development of forensic science; Crime Scene Management- Securing the crime scene; Documentation and evidence collection; Types of Evidence- Introductions to different types of evidence (biological, physical, trace, digital); Importance of preserving evidence integrity.

Unit 2: Biological Forensics

Bloodstain Pattern Analysis- Basics of bloodstain pattern analysis; Identifying and interpreting bloodstain patterns; DNA Analysis-Basics of DNA structure and function; DNA extraction and profiling techniques.

SECTION- II

Unit 3: Physical and Trace Evidence Analysis

Trace Evidence-Introduction to trace evidence (fibers, hairs, glass fragments, soil, paint etc.); Collection and analysis techniques; Ballistics and Firearms Examination-Introduction to firearms examination; Basics of bullet trajectory analysis.

Unit 4: Digital Forensics and Case Studies and Legal and Ethical Issues in CSI

Evidence Collection-Basics of digital evidence collection; Introduction to cyber forensics; Case Studies and Practical Applications Digital-Analyzing real-life case studies; Hands-on exercises in evidence collection and analysis; Ethics in Crime Scene Investigation-Integrity and professionalism; Handling sensitive information; Expert Testimony-Preparing for court testimony; Communicating findings to jurors; Legal Procedures and Protocols-Search and seizure laws; Chain of custody documentation; Career Pathways in CSI-Exploring CSI-related careers; Educational and training requirements.

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Course objectives:

1. Students will understand the basics of Crime Scene Investigation.
2. Students will understand the principles for examination of physical and trace evidence analysis.

Course learning outcomes:

1. All the basics of Crime scene investigation.
2. Develop a deeper understanding of Biological Forensics and trace evidence.

Required Books and Materials:

1. Richard M. Rau. And Travis J. (2000); Crime Scene Investigation: A Guide for Law Enforcement. National Institute of Justice. <http://www.ncjrs.org>.
2. Stuart J. H. and Nordby Jon J. (2014); Forensic Science: An Introduction to Scientific and Investigative Techniques. CRC Press.
3. Gardner R. M. (2018); Practical Crime Scene Processing and Investigation. CRC press
4. Howard A. H. and Lee H. C. (2019); Introduction to Forensic Science and Criminalistics. CRC Press.
5. John M. B. (2005); Forensic DNA Typing: Biology, Technology, and Genetics of STR Markers. Elsevier, Academic Press.
6. Stuart H. James and Paul E. Kish. (2005); Principles of Bloodstain Pattern Analysis: Theory and Practice. CRC Press.
7. Monturo C. (2019); Forensic Firearm Examination. Elsevier, Academic Press.
8. Casey E. (2010); Digital Evidence and Computer Crime: Forensic Science, Computers and the Internet. Elsevier, Academic Press
9. Bowen T. R. (2017); Ethics and the practice of forensic science. CRC Press.
10. Saferstein R. (2010); "Criminalistics: An Introduction to Forensic Science". Pearson.

List of Practical's:

1. Practical on securing a simulated crime scene, documenting the scene, and sketching the layout to ensure proper evidence preservation.
2. Identifying and interpreting various bloodstain patterns through hands-on practice will help students to understand their origin and type of impact.
3. Exercise in extracting DNA from biological samples using standard laboratory techniques.
4. Practical on collecting trace evidence such as fibers, hairs, and glass fragments from a mock crime scene.
5. Hands-on session examining firearms and understanding the basics of matching bullets to specific weapons.
6. Practical on properly seizing and preserving digital evidence from electronic devices.
7. Exercise on documenting the chain of custody for various types of evidence to maintain its integrity from collection to court presentation.

COURSE: FSAOC-2
Forensic Fingerprint Sciences

Theory: 15 Credit Hours

Practical: 30 Credit Hours

Theory examination: 25 marks
Practical examination: 25 marks
Total Marks: 50

Note: Instructions for setting question paper

The examiner will set a total of nine (9) questions covering the entire syllabus. Out of nine questions, Q.No. 1, containing five short -answer type questions that will cover the entire syllabus, will be compulsory. There will be 4 questions from each section. Students will attempt five questions in total by selecting two questions from each section and the compulsory question. All questions shall carry equal marks (5 marks each).

SECTION- I

Unit-1: Fingerprinting and their Pattern

History, Development and Importance of Fingerprints, Principles of Fingerprints, Fingerprints as Evidence: Recognition, Collection and Preservation. Establishment and Function of Fingerprint Bureau. Biological Development of Fingerprints, Biological Significance of Skin Pattern, Ridge Formation, Fingerprint Patterns, Pattern Areas, General and Individual Characteristics of Fingerprints, Level of fingerprinting and its classification.

Unit-2: Classification of Fingerprints

Classification of Fingerprints: Henry System of Classification, Battley's Single digit classification, Fingerprints Characteristics for Comparison: Pattern Area, Core, Delta, Type Lines, Poroscopy, Edgescopy, Ridge Characteristics. Fingerprint Pattern Types: Loop, Arch, Whorl, Composites, Accidental patterns etc.

SECTION- II

Unit-3: Development and taking of Fingerprints

Constituents of sweat residue, Various Methods of Development of Fingerprints: Physical (Black and Grey, Fluorescent and Magnetic Powder Method) and Chemical Methods, Fuming Methods, Laser Method, Lifting of Latent Fingerprints, developing fingerprints on gloves, Taking of Fingerprint from Living and Dead Person, Methods for making Inked fingerprint Specimen.

Unit-4: Recording, Examination and Presentation of Fingerprints

Ridge Counting and Tracing, Filling and Searching. Application of light sources in fingerprint detection, Preservation of developed fingerprints, Digital imaging for fingerprint

enhancement, Photography of Latent Traces. Evidence in the Court Latent Fingerprints and Chance Fingerprints in Criminal Investigation, Investigating Latent Fingerprints, Fingerprint as Forensic Evidence, Presentation of Fingerprint Evidence and Testimony in Court

Course objectives:

1. Students will understand the principles of Fingerprinting and their pattern.
2. Students will understand the basic techniques for developing and taking the fingerprints.

Course learning outcomes:

1. All the basic and advanced techniques for fingerprint development, taking, recording and presentation.
2. Develop a deeper understanding of Fingerprints and their pattern.

Required Books and Reading Materials:

1. Ames, D. T. (2010): Ames on Forgery: Its Detection and Illustration with Numerous Causes Celebres, Kessinger Publishing.
2. Bridges (1942; Practical Finger Printing, Funk and Washalls Co. New York.
3. Cherril F.R. (1954); The Fingerprints. System at Scotland Yard, Her Majesty's office, London.
4. C. Champod, C. Lennard, P. Margot and M. Stoilovic, Fingerprints and other Ridge Skin Impressions, CRC Press, Boca Raton (2004).
5. D.A. Ashbaugh, Quantitative-Qualitative Friction Ridge Analysis, CRC Press, Boca Raton (2000).
6. Ellen D (1997); The scientific examination of Documents, Methods and techniques. 2nd ed., Taylor& Francis Ltd.
7. Harrison, W.R. (1966): Suspect Documents: Their Scientific Examination. Sweet & Maxwell Ltd., London.
8. Hawthorne, W.H. and Wentworth, B. (2004): Personal Identification: Methods for the Identifications of Individuals, Living or Dead. Gunstock Hill, USA.
9. J.E. Cowger, Friction Ridge Skin, CRC Press, Boca Raton (1983).
10. Lee and Gaensleen's, Advances in Fingerprint Technology, 3rd Edition, R.S. Ramotowski (Ed.), CRC Press, Boca Raton (2013).
11. Mehta M. K. (1980); Identification of Thumb Impression & Cross Examination of Fingerprints, N. M. Tripathi (P) Ltd. Bombay.

List of Practical's:

1. To obtain Plain and rolled inked fingerprints and identify fingerprint Patterns.
2. To identify the ridge characteristics and perform ridge tracing and ridge counting.
3. To develop latent fingerprints with powder, fuming method and chemical
4. To perform Henrys Classification (Primary, Secondary, Single digit and AFIS classifications).
5. To study Poroscopy and Edgeoscopy.
6. Evaluation, sketching and reconstruction of outdoor crime scene (hit and run, shooting etc.).
7. Collection and Packaging of various Physical evidence.