

**Department of Criminology and Forensic Science  
(School of Applied Sciences)**

**Syllabus  
of  
B.Sc. Forensic Science  
(Year 2013 - 2016)**



**Dr. Harisingh Gour Vishwavidyalaya, Sagar**  
*(A Central University)*  
**Sagar – 470 003 (MP)**



## **B.Sc. (Forensic Science)**

### **DEPARTMENT OF CRIMINOLOGY & FORENSIC SCIENCE DR. HARISINGH GOUR VISHWAVIDYALAYA, SAGAR (M.P.) (A CENTRAL UNIVERSITY)**

#### **B.Sc. (Forensic Science)**

**(A 3 years – 6 Semester UG Programme)**

| <b>Semester</b>       | <b>Paper Code</b> | <b>Title of Paper</b>                            | <b>Name of Inst.</b> | <b>Credit</b> | <b>Max. Mark</b> |
|-----------------------|-------------------|--|----------------------|---------------|------------------|
| <b>Semester - I</b>   | CFS C-111         | Introduction to Forensic Science                 | JDS                  | 02            | 100              |
|                       | CFS C-112         | Police and Judicial Organizations                | RSY                  | 02            | 100              |
|                       | CFS C-113         | Forensic Science (Practical)                     | NKK                  | 02            | 100              |
| <b>Semester - II</b>  | CFS C-211         | Elementary Police Science                        | BA                   | 02            | 100              |
|                       | CFS C-212         | Detective Methods and Tools                      | VV                   | 02            | 100              |
|                       | CFS C-213         | Forensic Science (Practical)                     | RSY                  | 02            | 100              |
| <b>Semester - III</b> | CFSC- 311         | Indian Penal Code – 1860                         | DB                   | 02            | 100              |
|                       | CFS C-312         | Finger Prints and Questioned Documents           | NKK                  | 02            | 100              |
|                       | CFS C-313         | Forensic Science (Practical)                     | RSY                  | 02            | 100              |
| <b>Semester - IV</b>  | CFS C-411         | Criminal Procedure Code-1973 & Ind. Evidence Act | BA                   | 02            | 100              |
|                       | CFS C-412         | Criminalistics                                   | DB                   | 02            | 100              |
|                       | CFS-C-413         | Forensic Science (Practical)                     | NKK                  | 02            | 100              |
| <b>Semester – V</b>   | CFS-C-511         | Forensic Biology And Serology                    | VV                   | 02            | 100              |
|                       | CFS-C-512         | Chemical Separation And Instrumental Techniques  | RSY                  | 02            | 100              |
|                       | CFS-C-513         | Forensic Science (Practical)                     | BA                   | 02            | 100              |
| <b>Semester – VI</b>  | CFS-C-611         | Forensic Medicine                                | VV                   | 02            | 100              |
|                       | CFS-C-612         | Drug Analysis and Forensic Toxicology            | DB                   | 02            | 200              |
|                       | CFS C-613         | Forensic Science (Practical)                     | DB                   | 02            | 100              |

JDS – Prof. JD Sharma  
DB – Dr. Devasish Bose  
RSY – Dr. Rajesh Singh Yadav  
NKK – Dr. Navjot Kaur Kanwal  
BA – Dr. Beauty Arora  
VV – Dr. Vandana Vinayak



## **B.Sc. (Forensic Science)**

### **INTRODUCTION TO FORENSIC SCIENCE**

**(Paper code CFS-C-111)**

**UNIT – I : FORENSIC SCIENCE (8 hrs)**

Definition, History, Development and Scope of forensic Science in India. State and Central Forensic Science Laboratories, their structure and functioning

**UNIT – II : PHYSICAL EVIDENCES (7 hrs)**

Definition, types, class and individual characteristics, Principle of exchange, General information provided by physical evidences, Different search methods for locating physical evidences at scene of crime, Chain of Custody.

**UNIT – III : HANDLING OF PHYSICAL EVIDENCES-I (6 hrs)**

Preservation, Packing, labeling, transportation and forwarding of the following physical evidences, Biological samples Blood, semen, Saliva, urine, vomit, fecal material, hair etc., Botanical samples- Cannabis, opium, nux vomica etc., Toxicological samples-viscera, adulterated food stuff, blood, urine, vomit etc., Post mortem samples

**UNIT – IV : HANDLING OF PHYSICAL EVIDENCES-II (6 hrs)**

Preservation, packing, labeling, handling, transportation and forwarding of the following physical evidences: Chemical samples volatile liquids, nonvolatile liquids, flammable liquids, solid chemical etc., Ballistics samples-firearms, ammunitions, GSR etc., Fingerprint, impressions and documents, Physical samples-fiber, glass, textile, wire & cables, dust & soil etc.

**UNIT – V : EXPERTS AND INSTITUTIONS (7 hrs)**

Expert as per Indian Evidence Act, experts in court and their function, state and central government experts and institutions.



## **B.Sc. (Forensic Science)**

### **Suggested Readings:**

1. Saferstein: Criminalistics – An Introduction to Forensic Science, Prentice hall Inc. USA 91995)
2. James, S.H. and Nordby, J.J.; Forensic Science; an Introduction to Scientific and Investigative Techniques, CRC Press, USA (2003)
3. O' Hara & Osterberg : An Introduction to Criminalistics.
4. Forest: Forensic Science, An Introduction.
5. Lee, Honry : Advances in Forensic Science.
6. Sharma J D: Vidhivigyan Avem Vish Vigya.
7. Sharma J D: Apradh ka Vigyanik Anveshan.
8. Sharma B R: Forensic Science in Criminal Investigation and trials.
9. Mordby, J Deed Reckoning – The Art of Forensic science Detection, CRC Press LLC, Boca Raton FL, CRC Press (2000)



## **B.Sc. (Forensic Science)**

### **POLICE AND JUDICIAL ORGANIZATIONS**

**(Paper code CFS-C-112)**

#### **UNIT – I**

**(7 hrs)**

Police organization under central government: general information about their structure and function

[1] BSF [2] Assam rifle [3] CRPF [4] CISF [5] ITBP [6] NSG

#### **UNIT – II**

**(7 hrs)**

Police organization under central government: general information about their structure and function

BPR&D, CBI, IB, RAW, NCRB, NICFS, NPA, UT Police Force

International Police Organization: INTERPOLE- history, structure general and special notices

#### **UNIT – III**

**(7 hrs)**

State Police organization: general organization of police at state and range level.

Police organization at district level

The police and policing

Commissioner and system of policing

#### **UNIT – IV**

**(6 hrs)**

Other police department (state): criminal investigating department (CID)

State armed police, home guards and women police

Forensic science labs and other forensic institutions

#### **UNIT – V**

**(7 hrs)**

Organization of courts at block, district and state levels

Organization of supreme court of India

Introduction to labour court, consumer, juvenile etc



## **B.Sc. (Forensic Science)**

### **Suggested Readings:**

1. Ebbe, Obi N. Ingnatius, 2000, Comparative and International Criminal Justice System: Policing, Judiciary and Corrections, Butterworth, Boston.
2. Chakrabarti, Niramal Kant, 1995, Probation System in the Administration of Criminal Justice, Deep & Deep Publications, New Delhi
3. Choudhuri, Mrinmaya, 1995, Languishing for Justice : Being a Critical Survey of the Criminal Justice System, Datt Sons, Nagpur
4. Mehraj-ud-din, Mir, 1984, Crime and Criminal Justice System in India, Deep & Deep Publications, New Delhi
5. Das, Ram Mohan, 1982, Crime and Punishment in India: With a particular reference to the Manusmrti, Kanchan Publications, Bodh-Gaya



**B.Sc. (Forensic Science)**

**FORENSIC SCIENCE**

**(Paper code CFS-C-113)**

**(68 hrs)**

1. Packing, forwarding & labeling of the following physical evidence found at the scene of crime.  
(a) Biological fluids (b) Soil/dust (c) Wet physical evidences (d) Hair/fiber (e) Glass material (f) Liquids (g) Pharmaceutical products/drugs of abuse (h) Botanical material (i) Shell case/cartridge/bullet/pellets (j) Documents.
2. Casting of foot/footwear print from soft surface.
3. Location of visible & latent fingerprints.
4. Development of latent fingerprints.
5. Lifting of fingerprints.



**B.Sc. (Forensic Science)**

**ELEMENTARY POLICE SCIENCE**

**(Paper code CFS-C-211)**

**UNIT – I**

**(8 hrs)**

Police science: definition and scope

Who is an investigator?

Investigator and his qualities, general guidelines for investigator

Interview of witness

Interrogation of suspect

**UNIT – II**

**(7 hrs)**

Scene of crime: meaning of scene of crime, primary and secondary scene of crime

Types of scene of crime, search methods at scene of crime

Methods of preservation: photography: its importance, general guidelines, admissibility in courts, various forms such as videography, photogrammetry etc.

**UNIT – III**

**(7 hrs)**

Sketching of scene of crime:

Types of sketch, general guidelines for sketching, methods for determination of location, rough sketch, finished sketch, projection sketch, its importance

Investigation: FIR, case diary, cognizable and non cognizable offences, their investigation

**UNIT – IV**

**(6 hrs)**

Physical evidences: Definition, types, class and individual characteristics, Principle of exchange, general information provided by physical evidences, Different search methods for locating physical evidences at scene of crime, chain of custody.

**UNIT – V**

**(6 hrs)**

Handling of physical evidences:

Preservation, packing, labeling, transportation and forwarding physical evidences:

Biological samples such as blood, semen, urine, etc.

Chemical sample such as volatile and non volatile liquids, etc.

Physical samples such as fiber, glass, textile, etc.





## **B.Sc. (Forensic Science)**

### **Suggested Readings:**

1. Saferstein: Criminalistics – An Introduction to Forensic Science, Prentice hall Inc. USA 91995)
2. James, S.H. and Nordby, J.J.; Forensic Science; an Introduction to Scientific and Investigative Techniques, CRC Press, USA (2003)
3. O' Hara & Osterberg : An Introduction to Criminalistics.
4. Forest: Forensic Science, An Introduction.
5. Lee, Honry : Advances in Forensic Science.
6. Sharma B R: Forensic Science in Criminal Investigation and trials.
7. Mordby, J Deed Reckoning – The Art of Forensic science Detection, CRC Press LLC, Boca Raton FL, CRC Press (2000)



**B.Sc. (Forensic Science)**

**DETECTIVE METHODS AND TOOLS**  
**(Paper code CFS-C-212)**

**UNIT – I** (7 hrs)

Brief knowledge about detective and detective agencies in India

Introduction to Cr PC

**UNIT – II** (6 hrs)

Interview

Interrogation

**UNIT – III** (6 hrs)

Surveillance and its importance

Various types of surveillance methods used

**UNIT – IV** (8 hrs)

Brief idea about:

Narco test

Polygraph

DNA fingerprinting

Brain mapping

**UNIT – V** (7 hrs)

Modern detective tools:

Spy cameras

Micro chips

Taping



**B.Sc. (Forensic Science)**

**FORENSIC SCIENCE**

**(Paper code CFS-C-213)**

**(68 hrs)**

1. Location of physical evidence (s) by applying suitable search method at the indoor scene of crime.
2. Sketching of indoor scene of crime.
3. Preparation of physical evidence table for the exhibit recovered from the indoor scene of crime.
4. Sketching of outdoor scene of crime.
5. Location of physical evidence (s) by applying suitable search method at the outdoor scene of crime.
6. Prepare a physical evidence table for the outdoor scene of crime.



**B.Sc. (Forensic Science)**

**INDIAN PENAL CODE – 1860**

**(Paper code CFS-C-311)**

- Unit I : Administration of Justice : (8 hrs)**
- Meaning,
  - Difference between civil and Criminal Justice,
  - Object of Punishment,
  - Kinds of Punishment,
  - Primary and Sanctioning Rights,
  - Primary and Secondary functions of Court of Law.
- Unit II : Punishment Under the code: (6 hrs)**
- Death (s – 53),
  - Commutation of Sentence (ss – 54, 55),
  - Imprisonment (ss – 55, 60, 73-74),
  - Fine (ss – 63, 65 - 70).
  - Rules for Assessment of Punishment: (ss – 71, 72, 75).
- Unit III : General Exceptions (Ch.IV) : (7 hrs)**
- Mistake of fact (ss – 76,79),
  - Judicial act (ss – 77, 78),
  - Accident (s – 80),
  - Absence of Criminal Intention (ss - 81-86, 92-94),
  - Act done by consent (ss – 87-91),
  - Trifling Act (s - 95)
  - Right of Private Defence (ss – 96-99, 101, 103-105)
- Unit IV : Offences against Human body : (7 hrs)**
- Culpable homicide (ss – 299, 301, 304),
  - Murder (ss – 300-303),
  - Negligence (s – 304A),
  - Abetment to suicide (ss- 305-306),
  - Attempt to commit above offences (ss- 307-309).
  - Simple Hurt (ss- 319, 321, 323),
  - Grievous Hurt (ss- 320,322, 325)
  - Rape (ss- 375-376),
  - Unnatural offence (s-377)
- Unit V : Offences against Property : (6 hrs)**
- Theft (ss-378, 380-382),
  - Extortion (ss- 383 – 389),
  - Robbery (ss-390, 3902 – 394, 401),
  - Dacoity (ss-391, 395 – 400 & 402),
  - Cheating (ss-415 - 420)



**B.Sc. (Forensic Science)**

**FINGER PRINTS, DOCUMENTS AND OTHER IMPRESSIONS**  
**(Paper code CFS-C-312)**

- Unit I : Fingerprints : (8 hrs)**
- History,
  - Characteristics
  - Pattern Characteristics
  - Type of Pattern
  - Classification :
    - Primary classification
    - Secondary classification
    - Sub-Secondary classification
    - Final, Major, and Key classification, Battley system.
- Unit II : Fingerprints : (6 hrs)**
- Types of Fingerprints
  - Location and Preservation of fingerprints
  - Development of Latent prints
  - Matching of fingerprints
  - Presentation in Courts
- Unit III : Documents : (8 hrs)**
- Types of Document
  - Writing instruments and their characteristics
  - Ink and their examination
  - Paper and its examination
  - Nature of Document examination
- Unit IV : Hand writing : (6 hrs)**
- Hand writing and its characteristics
  - Factors affecting hand writing
  - Samples for comparison
  - Comparison of Hand writings
  - Disguised and Indented writings and their detection.
- Unit V : Typed and Computer generated documents, (6 hrs)**  
their comparison.  
Alteration in documents and their detection.  
Foot & Shoe prints, methods of their preservation and examination.  
Tyre marks and Track marks and their examination.



## **B.Sc. (Forensic Science)**

### **Suggested Readings:**

1. Rev. ED.; Ordway Hilton; Scientific Examination I Of Questioned Documents, Elsevier, New York; (1982)
2. Albert S. Osborn; Questioned Documents, Second Ed.; Universal Law Publishing, Delhi; (1998)
3. Albert S. Osborn; The Problem of Proot~ Secon Ed.; Universal Law Publishing, Delhi; (1998)
4. Charles C. Thomas, Typewriting Identification I.S.Q.D.; Billy Bates; Springfield, Illinois, USA, (1971)
5. Charles C. Thomas, I.S.Q.D. Identification System for Questioned Documents; Billy Prior Bates Springfield, Illinois, USA, (1971)
6. Wilson R. Harrison; Suspect Documents – Their Scientific Examination; Universal Law Publishing, Delhi. (1997)
7. Hard less, H.R. : Disputed Documents, handwriting and thumbs – print identification : profusely illustrated, Low Book Co., Allahabad, (1988)
8. David R. Ashbaugh; Quantitative and Qualitative Friction ridge analysis, CRS Press, (1999)
9. Mehta M. K. ; Identification of Thumb Impression & Cross Examination of Finger Prints, N. M. Tripathi (P) Ltd, Bombay (1989)
10. Henry C. Lee & R. E. Ganesslen, Advances in Finger Print Technology, ~RC Press, Boca Raton, London, (1991)



**B.Sc. (Forensic Science)**

**FORENSIC SCIENCE**

**(Paper code CFS-C-313)**

**(68 hrs)**

1. Taking of fingerprint on 10 digit fingerprint card.
  2. Primary classification of given 10 digit fingerprint card.
  3. Location, development and lifting of latent fingerprint.
  4. Decipher of secret writing.
  5. Examination of forged signature.
  6. Decipher of mechanically erased writing.
  7. Differentiation between typed and printed documents.
- Establishing the origin of documents i.e. manual typed or generated by print.



**B.Sc. (Forensic Science)**

**CRIMINAL PROCEDURE CODE-1973 & IND. EVIDENCE ACT**

**(Paper code CFS-C-411)**

- UNIT – I : CRIMINAL PROCEDURE CODE 1973 (7 hrs)**
- Constitution of Criminal Courts (Ss. 6 – 25)
  - Power of Courts (Ss. 26 – 35)
- UNIT – II : CRIMINAL PROCEDURE CODE 1973 (6 hrs)**
- Arrest of Persons (Ss. 41 – 60)
  - Processes to compel Appearance (Ss. 61 – 69)
  - Warrant of Arrest (Ss. 70 – 81)
- UNIT – III : CRIMINAL PROCEDURE CODE 1973 (6 hrs)**
- MAINTENANCE OF PUBLIC ORDER AND TRANQUILITY :**
- Unlawful Assemblies (Ss. 129 -132)
  - Preventive Action of the Police (Ss. 149 – 153)
  - Information to the Police and their Powers to Investigate (Ss. 154 – 166, 167 – 176).
- UNIT – IV : CRIMINAL PROCEDURE CODE 1973 (7 hrs)**
- Trial before a Court of Session (Ss. 225 – 236)
  - Trial of Warrant cases (Ss 238 – 243, Ss. 248 – 250)
  - Trial of Summons cases by Magistrates (Ss., 251 – 259)
  - Summary Trials (Ss. 260 – 265)
- UNIT – V : CRIMINAL PROCEDURE CODE 1973 (8 hrs)**
- Evidence in Inquiries and Trials (Ss. 291 – 293)
- INDIAN EVIDENCE ACT. :**
- Relevancy of facts (Ss. 5 -10)
  - Admission (Ss. 17, 22, 23, 25, 26)
  - Experts (Ss. 45, 46, 47, 47A)
  - Proof (Ss. 56 – 58)
  - Oral Evidence (Ss. 59 – 60)
  - Documentary Evidence (Ss. 61 - 65, 65B, 67, 67A, 73, 73A)
  - IEA Sections – 113A,B, 114A, 137 -38, 141 -43, 146, 148, 151, 159)





**B.Sc. (Forensic Science)**

**CRIMINALISTICS**

**(Paper code CFS-C-412)**

|                   |          |  |                |
|-------------------|----------|--|----------------|
| <b>UNIT – I</b>   | <b>:</b> | <b>PHYSICAL EVIDENCE</b>   | <b>(8 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Meaning, Types</li><li>• Importance</li><li>• Concept of Transfer evidence and Trace evidence</li></ul>  |                |
| <b>UNIT – II</b>  | <b>:</b> | <b>INTRODUCTION AND EXAMINATION OF:</b>  | <b>(7 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Hair and Fibers</li><li>• Dust and Soil</li><li>• Cement, Mortar and Concrete</li></ul>  |                |
| <b>UNIT – III</b> | <b>:</b> | <b>INTRODUCTION AND EXAMINATION OF:</b>  | <b>(6 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Glass</li><li>• Paint</li><li>• Analysis in Trap cases</li></ul>   |                |
| <b>UNIT – IV</b>  | <b>:</b> | <b>INTRODUCTION AND EXAMINATION OF:</b>  | <b>(7 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Tool Marks</li><li>• Firearm</li><li>• Explosives</li></ul>  |                |
| <b>UNIT – V</b>   | <b>:</b> | <b>ARSON :</b>   | <b>(6 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Chemical of combustion</li><li>• Types and condition of combustion</li><li>• General fuel types and combustion properties</li><li>• Commonly used Accelerants and their analysis</li></ul> |                |

**Suggested Readings:**

1. Saferstein: Criminalistics – An Introduction to Forensic Science, Prentice hall Inc. USA 91995)
2. C.G.G. Aitken and D.A. Stoney; The use of statistics in Forensic Science, Ellis Harwood Limited, England (1991)
3. James, S.H. and Nordby, J.J.; Forensic Science; an Introduction to Scientific and Investigative Techniques, CRC Press, USA (2003)
4. O' Hara & Osterberg : An Introduction to Criminalistics.
5. Forest: Forensic Science, An Introduction.



**B.Sc. (Forensic Science)**

**FORENSIC SCIENCE**

**(Paper code CFS-C-413)**

**(68 hrs)**

- 1. : EXAMINATION OF HAIR**
  - Difference between Hair and Fiber
  - Difference between Human and Animal Hair
  -
- 2. : EXAMINATION OF FIBER :**
  - Natural Fiber
  - Synthetic Fiber
  - Matching of cloth
- 3. : MATCHING OF GLASS**
- 4. : DETERMINATION OF DIRECTION OF ENTRY OF BULLET IN GLASS**
- 5. : PATTERN OF GLASS FRACTURE IN NON FILMED GLASS AND FILMED GLASS.**
- 6. : EXAMINATION OF TOOL-MARKS**
- 7. : IDENTIFICATION OF SHELL-CASE, BULLET AND SHOT USING VARNIER CALIPERS, AND SCREW GAUGE.**
- 8. : EXAMINATION OF FIRED EMPTY CARTRIDGE AND BULLET USING COMPARISON MICROSCOPE.**
- 9. : MEASUREMENT THE DEPTH OF CURVED GLASS USING SPHEROMETER**



**B.Sc. (Forensic Science)**

**FORENSIC BIOLOGY AND SEROLOGY**

**(Paper code CFS-C-511)**

- UNIT – I : BRIEF DESCRIPTION AND FUNCTION OF HUMAN (8 hrs)**
- Digestive System
  - Respiratory System
  - Circulatory System
  - Nervous System
  - Reproductive System
- UNIT – II : STRUCTURE, COMPOSITION AND EXAMINATION OF : (6 hrs)**
- Blood and Bloodstains
  - Seminal stains
  - Saliva and other Biological fluids such as Urine, Pus
- UNIT – III : (7 hrs)**
- Determination of Species of Origin
  - Grouping of Bloodstains and their techniques;
  - ABO, Rh and MN System
  - Genetic Markers and their classification
- UNIT – IV : ELECTROPHORESIS (6 hrs)**
- Principle, Types, Equipment and Processing
  - Immune electrophoresis
  - Analysis of Proteins by electrophoresis and their detection
- UNIT – V : D N A: (7 hrs)**
- Structure of DNA
  - Polymorphism in DNA
  - General idea about RFLP and PCR methods of biological fluid analysis

**Suggested Readings:**

1. E.J. Gardner, M. 1. Simmons and D.P. Snustad; Principles of Genetics; John Wiley, New York; (1991)



## **B.Sc. (Forensic Science)**

2. Richard Saferstein; Forensic Science Hand Book; Ed.; Prentice Hall, Englewood Cliff, New Jersey; (1982)
3. Biology Methods manual; Metropolitan Police Forensic Science Laboratory, London; (1978)
4. Kimball, John W; Biology; Arvind Publishing Co. New Delhi (1974)
5. Edwin, H. Mc Caney – Human Genetics, The Molecular Revolution, Jones & Bartlett Pub. London, (1993)
6. Albert's, B, Bray, D, Lewis, J, Roberts K & Watson, J.D; Molecular Biology of Cell, 2<sup>nd</sup> ed. Garland Pub. New York (1989)
7. Lewis. B Gene IV, Oxford University Press, England (1980)
8. Clifford, B.J; The examination and typing of Bloodstains in the Crime Laboratory, US Court Printing Press (1971)
9. Morrison, Robert D; Environmental Forensics Principles and Applications, CRC Press, Boca Raton, New York, (2000)
10. Ball Simon : Environmental Law – The law and policy relating to protection of environment, Universal Law Pub Co, Delhi, (1991)
11. Oates, D W, Brown, C W & Weigel, D L; Blood and tissue identification of selected birds and mammals; JPR study Projects Lincoln NE Nebraska Game and Perks Commission (1974)



**B.Sc. (Forensic Science)**

**CHEMICAL SEPARATION AND INSTRUMENTAL TECHNIQUES**

**(Paper code CFS-C-512)**

|                   |          |   |                |
|-------------------|----------|---|----------------|
| <b>UNIT – I</b>   | <b>:</b> | <b>GENERAL UNDERSTANDING OF:</b>  | <b>(8 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Distillations</li><li>• Sublimation</li><li>• Crystallization</li><li>• Solvent Extraction</li></ul>  |                |
| <b>UNIT – II</b>  | <b>:</b> | <b>CHROMATOGRAPHIC TECHNIQUES :</b>   | <b>(7 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Column chromatography</li><li>• Paper and Thin Layer chromatography</li><li>• Gas Liquid chromatography</li><li>• Liquid chromatography</li></ul> |                |
| <b>UNIT – III</b> | <b>:</b> | <b>SPECTROSCOPIC METHODS – PRINCIPLE, APPARATUS, PROCEDURE &amp; IMPORTANCE :</b>   | <b>(7 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Emission Spectroscopy</li><li>• Atomic Absorption Spectrophotometry</li></ul>   |                |
| <b>UNIT – IV</b>  | <b>:</b> | <b>SPECTROPHOTOMETRY METHODS</b>  | <b>(6 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• UV Spectrophotometry</li><li>• IR &amp; FTIR Spectrophotometry</li></ul>  |                |
| <b>UNIT – V</b>   | <b>:</b> | <b>GENERAL IDEA ABOUT :</b>   | <b>(6 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Neutron Activation Analysis</li><li>• Mass Spectrometry</li></ul>   |                |

**Suggested Readings:**

1. Lindsay, S.; High Performance Liquid Chromatography, New York, Wiley (1992)
2. Sharma PK: Instrumental Methods of chemical Analysis.
3. Chatwal and anand : Instrumental Methods of chemical Analysis.
4. Kriggle: Instrumental Methods.
5. Willard, Merrit and Dean : Instrumental methods of analysis
6. Saferstein: Forensic Science Handbook Vol. I, II, III.



**B.Sc. (Forensic Science)**

**FORENSIC SCIENCE**

**(Paper code CFS-C-513)**

**(68 hrs)**

**1. EXAMINATION OF BLOOD**

- To detect the presence of Blood.
- Difference between Human and Animal Blood
- Crystal test of Blood
- ABO grouping of Human Blood
- RH factor of human blood

**2. PRELIMINARY EXAMINATION OF SALIVA**

**3. PRELIMINARY EXAMINATION OF SEMEN**

**4. HANDLING AND OPERATION OF UV VIS SPECTROPHOTOMETER**

**5. HANDLING AND OPERATION OF LOW VOLTAGE ELECTROPHORESIS**

**6. HANDLING AND OPERATION OF GAS CHROMATOGRAPH**

**7. HANDLING AND OPERATION OF H.P.L.C**

**8. PREPARATION BY TLC PLATES.**

**9. P.C. OF INK BY ASCENDING DESCENDING AND RADIAL TECHNIQUES.**



**B.Sc. (Forensic Science)**

**FORENSIC MEDICINE**

**(Paper code CFS-C-611)**

|                   |          |  |                |
|-------------------|----------|--|----------------|
| <b>UNIT – I</b>   | <b>:</b> | <b>FORENSIC MEDICINE</b>   | <b>(8 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Forensic Medicine – Meaning and Scope</li><li>• Inquest</li><li>• Nature and Powers of Criminal Courts in India</li><li>• Procedure of calling a witness to a court</li></ul>                                  |                |
| <b>UNIT – II</b>  | <b>:</b> | <b>PROCEDURE IN COURT:</b>   | <b>(7 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Oath<br/>Examination – in –chief, Cross Examination and Re-Examination</li><li>• Medical Evidence</li><li>• Medicolegal Reports and Dying declaration</li><li>• Doctor as medical/ Expert witness</li></ul>    |                |
| <b>UNIT – III</b> | <b>:</b> |  | <b>(6 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Identity of a Person : Through all factors in fixing identity</li><li>• Post-Mortem Examination (Autopsy) (Types of Autopsy, objectives, Procedures)</li></ul>   |                |
| <b>UNIT – IV</b>  | <b>:</b> |  | <b>(6 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Meaning &amp; Modes of Death, and their characteristics</li><li>• Signs of Death and Post-Mortem changes</li></ul>   |                |
| <b>UNIT – V</b>   | <b>:</b> |  | <b>(7 hrs)</b> |
|                   |          | <ul style="list-style-type: none"><li>• Wounds and their characteristics</li><li>• Injuries due to heat, lighting, Electricity and Radiation</li><li>• Firearm injuries</li><li>• Differentiation between Ante-Mortem and Post-Mortem wounds</li></ul> |                |

**Suggested Readings:**

1. Modi JS: medical jurisprudence and Toxicology.
2. Keith Simpsen & Bernard Knight : Forensic Medicine
3. Poison, CJ, DJ Gee, B. Knight : Forensic Medicine
4. Reddy : Forensic Medicine



## **B.Sc. (Forensic Science)**

### **DRUG ANALYSIS AND FORENSIC TOXICOLOGY**

**(Paper code CFS-C-612)**

- UNIT – I : FORENSIC TOXICOLOGY - MEANING: (8 hrs)**
- Poison and Types of Poisoning
  - Action of Poison
  - Factors modifying the Action of Poison
  - Isolation of Poisons from viscera
- UNIT – II : CLASSIFICATION OF POISON : (7 hrs)**
- Isolation and analysis of metallic poison namely: As, Sb, Pb, Cu, Zn
  - Alcoholic drinks
  - Analysis of ethyl alcohol in biological fluids
  - Analysis of methanol
- UNIT – III : GENERAL IDEA AND EXAMINATION OF : (6 hrs)**
- Opium, Semi – synthetic opiates
  - Cannabis drugs such as Bhang, Ganja and Charas
  - LSD and Amphetamine
- UNIT – IV : NARCOTIC DRUGS AND PSYCHOTROPIC SUBSTANCE ACT 1985 : (6 hrs)**
- General Idea about NDPS Act.
  - Sections 15 – 32, 37.
- UNIT – V : GENERAL IDEA ABOUT EXAMINATION OF: (7 hrs)**
- Snake Venom
  - Imp. Benzodiazepines
  - Phenothiazines
  - Barbiturates

#### **Suggested Readings:**

1. Clark, E.G.C., Isolation and identification of Drugs, Vol. I and Vol. II, Academic Press, 1986.
2. Connors. , A Text Book of Pharmaceuticals analysis, Interscience, New York, 1975.
3. Saferstein; Forensic Science Handbook, Vols. I, II; (Ed); Prentice Hall, Englewood Cliffs, NJ; (1988)
4. Modi, Jaishing P., Textbook of Medical Jurisprudence & Toxicology, M.M. Tripathi Pub., 2001.





**B.Sc. (Forensic Science)**

**FORENSIC SCIENCE**

**(Paper code CFS-C-613)**

**(68 hrs)**

1. Identification of anion by colour test.
2. Determination of cations by spot test
3. Isolation of Non Volatile poison by solvent Extraction.
4. Extraction of Ethanol by simple distillation
5. Measurement of absorption Maxima of some organic solvent by UV visible spectrophotometer
6. Calculation of strength of some organic solvent by UV visible spectrophotometer
7. Separation of some metal ions by Paper Chromatography
8. Separation of some basic drugs by Thin Layer Chromatography
9. Separation of some Pesticide by Thin Layer Chromatography
10. Separation of few volatile solvents by Gas Chromatography
11. Separation of some Benzodiazepines by HPLC