

# **PERIYAR UNIVERSITY**

**PERIYAR PALKALAI NAGAR**

**SALEM – 636011**

**DEGREE OF BACHELOR OF SCIENCE**

**CHOICE BASED CREDIT SYSTEM**

**Syllabus for**

**B.Sc., Forensic Science**

**(SEMESTER PATTERN)**

**For Candidates admitted in the Colleges affiliated to  
Periyar University from 2020-2021 onwards**

## **REGULATIONS:**

### **1. Eligibility for Admission:**

Candidate for admission to the first year degree of Bachelor of Science Course shall be required to have passed the Higher Secondary Examination (Academic or vocational stream with Physics/Chemistry/Botany/Zoology/Biology under higher secondary board of examination stream) conducted by the Government of Tamilnadu or any other examination accepted by the syndicate of Periyar University, subject to such condition as, may be prescribed thereto, are permitted to appear and qualify for B.Sc, Degree in Forensic Science.

### **2. Eligibility for award of degree:**

A Candidate shall be eligible for the award of degree only if he/she has undergone, the prescribed course of study in a college affiliated to the University for a period not less than three academic years, comprising six Semester and passed the examination prescribed and full filled such condition as have been prescribed there for

### **3. Course of Study**

a. Objective of the Programme:

- i. To provide the basic and essential knowledge regarding various activities undertaken and necessary to run socially responsible business organization
- ii. To impart certain basis skills and aptitude which will be useful in taking up any particular useful in taking up any particular activity in Hospitality Industry.
- iii. To develop the personality so as to become responsible citizen with greater awareness about the Indian society and its culture.
- iv. To provide a global view of several multinational hotel and their functions which Support hotel systems.

b. The Programme of study shall consist of foundation courses, skill based elective courses (SBEC) and non-major elective course.

c. The non major elective courses (NMEC) offered by a department is meant for students studying other Programme (i.e.) FS students have to study NMEC offered by other departments.

The course of study shall comprise instruction in the following subjects according to syllabus and books prescribed from time to time.

### B.Sc (Forensic Science)

Part	Paper Code	Course	Title of the Paper	Hours/ Week	Credits	Internal (25%)	External (75%)	Total
<b>SEMESTER - I</b>								
I		Language-I	Tamil – I	6	3	25	75	100
II		Language-I	English – I	6	3	25	75	100
III		Core: I	Introduction to Forensic Science	5	5	25	75	100
III		Core- II	Crime and Society	4	5	25	75	100
III		Allied –I	Principles of Criminology	4	5	25	75	100
IV		Value Education	Yoga	2	2	25	75	100
IV		Add on course	Professional English - I	3	2	25	75	100
<b>SEMESTER - II</b>								
I		Language-II	Tamil – II	6	3	25	75	100
II		Language-II	English – II	4	3	25	75	100
II		NMSDC	Language Proficiency for Employability	2	2	25	75	100
III		Core: III	Forensic Psychology	5	5	25	75	100
III		Core- IV	Criminal Law	4	5	25	75	100
III		Allied –II	Vigilance and Security Management	4	4	25	75	100
IV		EVS	Environmental Studies	2	2	25	75	100
IV		Add on course	Professional English - II	3	2	25	75	100

### B.Sc (Forensic Science)

Part	Paper Code	Course	Title of the Paper	Hours/ Week	Credits	Internal (25%)	External (75%)	Total
<b>SEMESTER – III</b>								
III		Language-III	Tamil – III	6	3	25	75	100
III		Language-III	English – III	6	3	25	75	100
III		Core-V	Forensic Medicine	6	5	25	75	100
III		Core-VI	Technology Methods in Forensic Science	5	5	25	75	100
III		Allied- I	Human Rights and Criminal Justice Administration	5	4	25	75	100
IV		NMEC-I	Basics of Forensic Science	2	2	25	75	100
V		Online course	Swayam/ NPTEL etc. *		2			
<b>SEMESTER – IV</b>								
III		Language- IV	Tamil – IV	6	3	25	75	100
III		Language- IV	English – IV	4	3	25	75	100
III		Core-VII	Accident Investigation	6	5	25	75	100
III		Allied – II	Cyber Crimes	6	4	25	75	100
IV		<b>SBEC</b>	<b>Digital Skills for Employability-Office Fundamentals</b>	<b>2</b>	<b>2</b>	<b>25</b>	<b>25</b>	<b>100</b>
III		SBEC-I	Introduction to Biometry	2	2	25	75	100
III		SBEC-II	Guidance and Counselling	2	2	25	75	100
IV		NMEC-II	Digital & Cyber Forensic	2	2	25	75	100
III		Core	Internship **		2		100	100

**\*Students should submit their online course certificates at the end of the VI semester.**

**\*\*The students should undergo compulsory one month internship programs during the III semester vacation. At the end of the program, students should submit the report.**

**B.Sc (Forensic Science)**

Part	Paper Code	Course	Title of the Paper	Hours/ Week	Credits	Internal (25%)	External (75%)	Total
<b>SEMESTER – V</b>								
III		Core-VIII	Forensic Ballistic	6	5	25	75	100
III		Core-IX	Forensic Toxicology	6	5	25	75	100
III		Core-X	Forensic Dermatoglyphics	6	5	25	75	100
III		Elective- I	Serology and DNA typing	6	4	25	75	100
III		Core Practical - I	Forensic Practical - I	6	4	40	60	100
<b>SEMESTER – VI</b>								
III		Core-XI	Private Detective and Investigation	6	5	25	75	100
III		Core-XII	Introduction to Research Methodology	4	4	25	75	100
III		Core-XIII	Hand Writing Identification & Recognition	4	5	25	75	100
III		Elective-II	Contemporary Forms of Crime	6	5	25	75	100
III		Elective	Emerging Technology for Employability	2	2	25	75	100
III		Viva-Voce	Project Work	6	10	25	75	100

**Total credit : 154**

**Total Marks CIA : 1015**

**EA : 3035**

**Total : 4100**

**B.Sc. FORENSIC SCIENCE**

**Theory - Question Paper Pattern**

**Question paper pattern-75 marks**

Time: 3 hrs

Max.Marks:75

Minimum pass : 30

**Part-A: 15x 1 = 15**

**Choose the correct answer**

(Answer all Questions) (Three Questions from each unit)

**Part-B: 2x 5 = 10**

**Paragraph pattern**

**(Answer any two Questions)**

(One question from each unit) Answer any two questions out of five questions

**Part-C: 5x 10 = 50**

**Essay pattern**

**(Answer all Questions)**

(One question from each unit) with internal choice

**Practical-Question Paper Pattern**

**Time: 6hrs**

**Marks : 100**

**External marks : 60**

**Minimum pass : 24**

Record

- 10 marks

Written procedure

- 10 marks

Practical

- 40 marks

## **5. REQUIREMENT FOR PROCEEDINGS TO NEXT SEMESTER**

Candidates shall be eligible to go to next semester, only if they satisfy the condition Prescribed by the syndicate from time to time.

## **6. PASSING MINIMUM**

A candidate shall be declared to have passed in each paper; If He/ She secures not less than 40% of the Marks prescribed for the examination. He/ She shall be declared to have passed the whole examination if he /she pass in all the papers as per the scheme of Examination eligible to go to next semester only if they satisfy the condition prescribed by the syndicate from time to time.

## **7. CLASSIFICATION OF SUCCESSFUL CANDIDATES**

Successful candidates, passing all the examinations securing the marks prescribed for, core, Allied, SBEC and NMEC course together shall be declared to have passed the examination in First / Second / Third class.

Candidates who obtained 75% of marks and above shall be deemed to have passed the Programme with distinction, provided they passed the examination at the **First appearance**

## **8. RANKING**

Candidate who passes all examination prescribed for the course in the **first appearance** only is eligible for ranking.

## **9. MAXIMUM DURATION FOR THE COMPLETION OF THE U.G PROGRAMME**

The maximum duration for completion of U.G programme shall not exceed twelve semesters.

## **10. COMMENCEMENT OF THE REGULATION**

The regulation shall take effect from the academic year 2020-2021, i.e. for students who are admitted to the first year of the programme, during the academic year 2020-2021 and thereafter.

## **11. TRANSITORY PROVISION**

Candidates who were admitted to the U.G Programme of study before 2020-2021 shall be permitted to appear for the examination under those regulation for the period of three years i.e. up to and inclusive of the examination of April / May 2024. Thereafter they may permitted to appear for the examination only under the regulation there in force.

## **SEMESTER-I**

### **CORE – I**

#### **INTRODUCTION TO FORENSIC SCIENCE**

##### **UNIT I History of Development of Forensic Science in India**

Functions of forensic science. Historical aspects of forensic science.

Definitions and concepts in forensic science. Scope of forensic science.

Need of forensic science. Basic principles of forensic science. Frye case and Daubert standard.

##### **UNIT II Tools and Techniques in Forensic Science**

Branches of forensic science. Forensic science in international perspectives, including set up of INTERPOL and FBI.

##### **UNIT III**

Duties of forensic scientists. Code of conduct for forensic scientists. Qualifications of forensic scientists.

Data depiction. Report writing.

##### **UNIT IV Organizational set up of Forensic Science Laboratories in India**

Hierarchical set up of Central Forensic Science Laboratories, State Forensic Science Laboratories, Government Examiners of Questioned Documents, Fingerprint Bureaus, National Crime Records Bureau.

##### **UNIT V**

Police & Detective Training Schools, Bureau of Police Research & Development, Directorate of Forensic Science and Mobile Crime Laboratories. Police Academies. Police dogs. Services of crime laboratories. Basic services and optional services.

#### **BOOKS FOR STUDY AND REFERENCES**

1. B.B. Nanda and R.K. Tiwari, Forensic Science in India: A Vision for the Twenty First Century, Select Publishers, New Delhi (2001).
2. M.K. Bhasin and S. Nath, Role of Forensic Science in the New Millennium, University of Delhi, Delhi (2002).
3. S.H. James and J.J. Nordby, Forensic Science: An Introduction to Scientific and Investigative Techniques, 2nd Edition, CRC Press, Boca Raton (2005).
4. W.G. Eckert and R.K. Wright in Introduction to Forensic Sciences, 2nd Edition, W.G. Eckert (ED.), CRC Press, Boca Raton (1997).
5. R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004).



6. W.J. Tilstone, M.L. Hastrup and C. Hald, Fisher's Techniques of Crime Scene Investigation, CRC Press, Boca Raton (2013).

**SEMESTER-I**  
**CORE – II**  
**CRIME AND SOCIETY**

**UNIT I Basics of Criminology**

Definition, aims and scope. Theories of criminal behavior – classical, positivist, sociological.

Criminal anthropology.

Criminal profiling. Understanding modus operandi. Investigative strategy.

Role of media.

**UNIT II Crime**

Elements, nature, causes and consequences of crime. Deviant behavior. Hate crimes, organized crimes and public disorder, domestic violence and workplace violence.

**UNIT III White collar crimes**

Victimology. Juvenile delinquency. Social change and crime.

Psychological Disorders and Criminality. Situational crime prevention.

**UNIT IV Criminal Justice System**

Broad components of criminal justice system. Policing styles and principles. Police's power of investigation.

**UNIT V**

Filing of criminal charges. Community policing. Policing a heterogeneous society. Correctional measures and rehabilitation of offenders.

Human rights and criminal justice system in India.

**BOOKS FOR STUDY AND REFERENCES**

1. S.H. James and J.J. Nordby, Forensic Science: An Introduction to Scientific and Investigative Techniques, 2nd Edition, CRC Press, Boca Raton (2005).
2. D.E. Zulawski and D.E. Wicklander, Practical Aspects of Interview and Interrogation, CRC Press, Boca Raton (2002).
3. R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004).

4. J.L. Jackson and E. Barkley, Offender Profiling: Theory, Research and Practice, Wiley, Chichester (1997).
5. R. Gupta, Sexual Harassment at Workplace, LexisNexis, Gurgaon (2014).

**SEMESTER-I**  
**ALLIED - I**  
**PRINCIPLES OF CRIMINOLOGY**

**UNIT I Introduction**

Criminology, Crime – definitions; historical perspectives; nature, origin and scope. Criminology as a social science, relations with other social sciences, medicine & law.

**UNIT II Schools of Criminology**

Pre-classical, Classical, Neo-Classical, Positive, Cartographic, Biological and Constitutional Schools.

**UNIT III Criminal Justice System**

Structure of Criminal Justice System in India. Role of legislature, police, judiciary and prison system in Criminal Justice; co-operation and co-ordination among the various sub systems of criminal justice system.

**UNIT IV Sociological Theories**

Differential Association Theory, Group Conflict Theory, Containment Theory, Subculture Theory, Labeling Theory

**UNIT V Psychological Theories**

Theories of personality – Freud, Theories of learning – Pavlov, Skinner, Thorndike, Theories of Motivation

**BOOKS FOR STUDY AND REFERENCES**

1. Siddique, A. (1993). Criminology, Problems and Perspectives (2<sup>nd</sup> ed.), Lucknow: Eastern Book House.
2. Chockalingam, K. (1997). „Kuttraviyal“ (Criminology) in Tamil. Chennai: Parvathi Publications.
3. Conklin, J. E. (2001), Criminology, Macmillan Publishing Company
4. Sutherland, H.E., & Cressey, D.R. (1974). Principles of Criminology, Philadelphia: Lippincott.
5. George Vold and Thomas J. Bernard. (1986). Theoretical Criminology. New York: Oxford University Press.
6. Walter C. Reckless. (1967). The Crime Problem. Bombay: Vakols, Feffner & Simons P. Ltd.
7. Titus Reid. (1982). Crime & Criminology. New York: Holt, Rinehard & Winstoon.
8. Richard Quinney and John Wildeman. (1977). The Problem of Crime – A critical

- introduction to criminology. London: Harper & Row.
9. Carson R. C. and James N. Butcher. (1992). Abnormal psychology and Modern Life, Harper Collinns Publisher Inc.
  10. Fathali M. Hoghaddam (1998) Social Psychology: Exploring Universals Across Cultures. New York: W. H. Freeman and Company,
  11. Garrett H. E. (1961) General Psychology. New Delhi: Eurasia Publishing House Ltd.

## **SEMESTER – II**

### **CORE-III**

### **FORENSIC PSYCHOLOGY**

#### **UNIT I Basics of Forensic Psychology**

Definition and fundamental concepts of forensic psychology and forensic psychiatry. Psychology and law. Ethical issues in forensic psychology.

Assessment of mental competency. Mental disorders and forensic psychology.

#### **UNIT II**

Psychology of evidence – eyewitness testimony, confession evidence. Criminal profiling.

Psychology in the courtroom, with special reference to Section 84 IPC.

#### **UNIT III Psychology and Criminal Behavior**

Psychopathology and personality disorder. Psychological assessment and its importance.

Serial murderers. Psychology of terrorism.

#### **UNIT IV**

Biological factors and crime – social learning theories, psycho-social factors, abuse.

Juvenile delinquency – theories of offending (social cognition, moral reasoning),

Child abuse (physical, sexual, emotional), juvenile sex offenders, legal controversies.

#### **UNIT V Detection of Deception**

Tools for detection of deception – interviews, non-verbal detection, statement analysis, voice stress analyzer, hypnosis.

Polygraphy – operational and question formulation techniques, ethical and legal aspects, the guilty knowledge test.

Narco analysis and brain electrical oscillation signatures – principle and theory, ethical and legal issues.

### **BOOKS FOR STUDY AND REFERENCES**

1. A.A. Moenssens, J. Starrs, C.E. Henderson and F.E. Inbau, Scientific Evidence in Civil and Criminal Cases, 4th Edition, The Foundation Press, Inc., New York (1995).
2. R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004).

3. J.C. DeLadurantey and D.R. Sullivan, Criminal Investigation Standards, Harper & Row, New York (1980).
4. J. Niehaus, Investigative Forensic Hypnosis, CRC Press, Boca Raton (1999).
5. E. Elaad in Encyclopedia of Forensic Science, Volume 2, J.A. Siegel, P.J. Saukko and G.C. Knupfer(Eds.), Academic Press, London (2000).

**SEMESTER – II**  
**CORE-IV**  
**CRIMINAL LAW**

**UNIT I Law to Combat Crime**

Classification – civil, criminal cases. Essential elements of criminal law. Constitution and hierarchy of criminal courts.

Criminal Procedure Code. Cognizable and non-cognizable offences.

Bailable and non-bailable offences.

**UNIT II Indian Penal Code**

Sentences which the court of Chief Judicial Magistrate may pass.

Summary trials – Section 260(2).

Judgements in abridged forms – Section 355.

Indian Penal Code pertaining to offences against persons – Sections 121A, 299, 300, 302, 304A, 304B, 307, 309, 319, 320, 324, 326, 351, 354, 359, 362.

Sections 375 & 377 and their amendments.

**UNIT III**

Indian Penal Code pertaining to offences against property Sections – 378, 383, 390, 391, 405, 415, 420, 441, 463, 489A, 497, 499, 503, 511.

Indian Evidence Act – Evidence and rules of relevancy in brief. Expert witness. Cross examination and re-examination of witnesses.

Sections 32, 45, 46, 47, 57, 58, 60, 73, 135, 136, 137, 138, 141.

Section 293 in the code of criminal procedure.

**UNIT IV Constitution of India**

Preamble, Fundamental Rights, Directive Principles of State Policy. – Articles 14, 15, 20, 21, 22, 51A.

**UNIT V Acts Pertaining to Socio-economic and Environmental Crimes**

Narcotic, Drugs and Psychotropic Substances Act. Essential Commodity Act.

Drugs and Cosmetics Act. Explosive Substances Act. Arms Act.

Dowry Prohibition Act.

Prevention of Food Adulteration Act. Prevention of Corruption Act.

Wildlife Protection Act. I.T. Act. Environment Protection Act. Untouchability Offences Act

### **BOOKS FOR STUDY AND REFERENCES**

1. D.A. Bronstein, Law for the Expert Witness, CRC Press, Boca Raton (1999).
2. Vipra P. Sarthi, Law of Evidence, 6th Edition, Eastern Book Co., Lucknow (2006).
3. A.S. Pillai, Criminal Law, 6th Edition, N.M. Tripathi Pvt Ltd., Mumbai (1983).
4. R.C. Nigam, Law of Crimes in India, Volume I, Asia Publishing House, New Delhi (1965).
5. (Chief Justice) M. Monir, Law of Evidence, 6th Edition, Universal Law Publishing Co. Pvt. Ltd., New Delhi (2002).

**SEMESTER – II**  
**ALLIED – II**  
**VIGILANCE AND SECURITY MANAGEMENT**

**UNIT I Introduction**

Vigilance: Meaning and Scope, Role of Vigilance in processing disciplinary enquiry cases, Investigation of mediclaims and other corruption cases. State and Central Vigilance Commissions. Security: Developments in India, Role of CISF in Industrial Security.

**UNIT II Dynamics of Security**

Security aspects- security of man, material, information such as file, commercial formula, technical information, design sketches, models, cassettes etc. Information security – Computer hardware, software and liveware security, Computer based financial frauds and computer viruses and worms, Current and future danger posing corporate executive.

**UNIT III Types of Security Management**

Access control system – Identity, screening, movement control, computer security systems: Security alarm systems, Fire alarm systems- Fire prevention and precautions, protective equipment; Deployment of Dog squad, Emergency preparedness plan: Security Guards – Duties and responsibilities; other modern equipments.

**UNIT IV Private Security and related laws**

Private security agencies – private security guard – license – The Private Security Agencies (Regulation) Act, 2005

**UNIT V Managing a Security Organization**

Security and Safety practices in financial institutions, Industrial Organizations and Commercial Establishments; dealing with trespass/intrusion, Emergency procedure, Ethics of Security.

**BOOKS FOR STUDY AND REFERENCES**

1. Chaturvedi, TN. (1991) Indian Banking: Crime and Security in Indian Banks, New Delhi: Aashish Publishing House.
2. Chitkara, MG. (1997). Corruption „N" Cure, APH Publishing House, New Delhi.
3. Halder Dipak. (1986). Industrial Security in India, New Delhi: Aashish Publishing House.
4. Ranjit Sen Gupta. (1994). Management of Internal Security, New Delhi: Lancer

- Publisher.
5. Mitra Chandran. (1998). The Corrupt Society. Delhi: Viking
  6. Sinha, R. K. (2000) Crimes affecting State Security – Problems and recent trends. New Delhi: Deep and Deep Publications.

**SEMESTER – III**  
**CORE - V**  
**FORENSIC MEDICINE**

**UNIT I**

**DEATH INVESTIGATIONS** Fundamental aspects and scope of forensic medicine. Approaching the crime scene of death. Obtaining first hand information from the caller. Rendering medical assistance to the victim, if alive. Protecting life. Recording dying declaration. Identifying witnesses and, if possible, suspect. Interviewing onlookers and segregating possible witnesses. Suspect in custody – initial interrogation and searching for evidence.

**UNIT II**

**Role of Forensic Medicine in court** – Meaning and Scope Inquest Nature and Powers of Criminal Courts in India Procedure of calling a witness to a court.

**Procedure in court:** Oath Examination – in –chief, Cross Examination and Re-Examination Medical Evidence Medico legal Reports and Dying declaration Doctor as medical/ Expert witness

**UNIT III**

**Autopsy** Medical Autopsy: Introduction and objectives, rules for medico legal autopsy, external and internal examination of body, collection of Ante-mortem and post-mortem samples, autopsy report.

**UNIT IV**

**Thanatology-** Definition of death. Types of death(somatic and molecular).Medico-legal aspects of death – Causes of death such as asphyxia(strangulation, hanging, drowning etc), electrocution, thermal trauma, heat burns, starvation, natural death, sudden death etc. Changes after death (immediate, early and late changes) and Determination of time since death.

## **UNIT V**

**Wounds and Injuries-** Definition of wounds and injuries and laws governing them. Types and classification of injuries. Ante mortem and post mortem injuries. Aging of injuries. Artificial injuries. Difference between suicidal, homicidal and accidental injuries.

### **BOOKS FOR STUDY AND REFERENCES**

1. Forensic medicine and toxicology: principles and practice, Professor Krishna Vij Publisher: Elsevier , 5 edition ,2014
2. Practical Aspects of Forensic Medicine, Dr T.D. Dogra Dr. AD Aggrawal jaypee publishers,2014.
3. Parikh's textbook of medical jurisprudence, forensic medicine and toxicology Professor C. K. Parikh ,CBS; 6 edition, 2007
4. The essentials of forensic medicine and toxicology Professor K.S. Narayan Reddy Jaypee Brothers Medical Publishers; 34th edition 2017
5. Principles of forensic medicine Professor Apurva Nandy New Central Book Agency; 3rd Revised edition edition 2010
6. A Textbook of Medical Jurisprudence and Toxicology Dr. Jaising P. Modi ( Edited by Justice K Kannan ,Lexis Nexis; 24th edition 2012



**SEMESTER – III**  
**CORE - VI**  
**TECHNOLOGY METHODS IN FORENSIC SCIENCE**

**UNIT I**

**GC:** Theoretical principles, instrumentations and technique, columns, stationary phases, detectors, Forensic applications.

**HPLC:** Theory, Instrumentation, Technique, column, detectors, LC-MS, Forensic applications.

**TLC and HPTLC:** Theory, Instrumentation, Technique and Forensic applications.

**UNIT II**

**Microscopy-** Stereomicroscope, Comparison microscope, Electron Microscopy TEM, SEM and their forensic Application.

**UNIT III**

**Electrophoresis Technique:** General principles, Factors affecting electrophoresis, Sodium dodecylsulphate (SDS) polyacrylamide gel electrophoresis, Agrose gel electrophoresis, Gel immunediffusion, Immuno- electrophoresis.

**UNIT IV**

1. **Basic Spectroscopy--** Introduction, electromagnetic radiations, full range,

**A. UV-Visible** – principal absorbance, transmittance, Beer-Lambert's laws and its applications of UV-Visible

**B. IR-**molecular spectra, electronics, vibrational, rotational spectra. Principles, diagrams, working and construction, uses and applications and IR spectroscopy

**UNIT V**

1. **AAS-** Introduction, Basic principles, Instrumentation and Techniques, Forensic applications.

2. **MASS Spectroscopy-** Principle, Instrumentation and working, Forensic applications.

### **BOOKS FOR STUDY AND REFERENCES**

1. D.A. Skoog, D.M. West and F.J. Holler, Fundamentals of Analytical Chemistry, 6th edition 1992.
2. Srivastava Meena, Yadav R. S Principles Of Laboratory Techniques And Methods, 2007.
3. W. Kemp, Organic Spectroscopy, 3 rd Edition, Macmillan, Hampshire (1991).
4. J.W. Robinson, Undergraduate Instrumental Analysis, 5th Edition, Marcel Dekker, Inc., New York (1995).
5. -Instrumental Methods of Analysis by Willard H.W Merritt, L.L Dean J A Settle FA, , 7th Edition, CBS, 2004.
6. -Analytical Chemistry for Technicians by Kenkel, 4th edition CRC Press, 2013.
7. -Instrumental Methods of Chemical Analysis by Galen W. Ewing, McGraw Hill Higher Education; 5th Revised edition

## **SEMESTER – III**

### **ALLIED - I**

#### **HUMAN RIGHTS AND CRIMINAL JUSTICE ADMINISTRATION**

##### **UNIT I Introduction**

Human Rights- Definition, Theories, forms / types of Human Rights

##### **UNIT II National and International Instruments**

UDHR, ICCPR, ICESCR, Constitution of India- Part III and Part IV, Protection of Human Rights Act 1993

##### **UNIT III Human Rights and Criminal Justice Agencies**

Custodial violence, Handcuffing, Rights of the accused, Rights of prisoners, Rights of victims of human rights violations

##### **UNIT IV Human Rights Violations**

Human rights violations of Women, Children, Minorities, Refugees, SC/STs, Elderly people

##### **UNIT V Human Rights Agencies**

Human rights agencies- National Human Rights Commission (NHRC) and State Human Rights Commission (SHRC) - role, structure and functioning; UN Organizations, Amnesty International, Human Rights Watch

#### **BOOKS FOR STUDY AND REFERENCES**

1. Human rights Today – A United Nations Priority, U.N. Publications.  
Department of Public information, United Nation, New York.
2. Human rights: A source book, (1996) NCERT publications, New Delhi
3. Iyer V.R. Krishna (1986) Human Rights and the Law, Vedpal Law House, Indore.
4. Parmar, Lalit., (1998). Human Rights, Anmol Publications Pvt Ltd. New Delhi.
5. Sen S. (1998) Human Rights in Developing Society, APH Publishing Corporation, New Delhi
6. Subramanian S. (1997) Human Rights: International Challenges, Manas Publications New Delhi.
7. Thilagaraj. R. (Ed) (2002) Human Rights and Criminal Justice Administration, APH

Publishing Corporation, New Delhi

8. Universal declaration of Human rights, 1948.

9. Vadackumchery, James (1996) Human Rights and the Police in India, APH  
Publishing Corporation, New Delhi

### **SEMESTER – III**

#### **NMEC-I**

### **BASICS OF FORENSIC SCIENCE**

#### **UNIT I**

**Crime:** Definition of crime, characteristics of crime, classification of crimes, A brief ideas about White collar crime, professional crime, organized crime, present scenario of crime in India.

#### **UNIT II**

**Crime scene Investigation:** Definition of Crime Scene. Classification of crime Scene: indoor & outdoor, primary & secondary, macroscopic & microscopic crime scene. Significance of crime scene, argument and ethics of crime scene.

**Physical evidence,** Definition, classification of physical evidence, types of physical evidences, sources of physical evidence, signification and value of physical evidence, linkage between crime scene, victim and criminal, study of some special crime scene such as mass disaster, terror attack, geological scene and explosive etc.

#### **UNIT III**

**Basics of Forensic Science:** Introduction Global History and Scope, Need and Development Principles, emphasizing on Specific contribution of Scientists in the field of Forensic Science.

#### **UNIT IV**

**Domains in Forensic Science:** Branches of Forensic Science, Police officers, Prosecution, Judicial Officers and Medico legal expert etc. Role and Qualifications of forensic scientists. Code of conduct for forensic scientists, Ethical issue in Forensic Science, professional standards for practice of Criminalistics, sanction against expert for unethical conduct.

#### **UNIT V**

**Organization set up of Forensic Science Laboratory:** Structure and function of State and regional Forensic Science Laboratory, Central Forensic Science Laboratory and facility provided, Mobile Forensic Science Laboratory. Directorate of Forensic Science Service.

Police and Forensic scientist relationship, role of FSL in criminal investigation, relationship between forensic expert and judiciary officer, Importance of FSL, National and International scenario of FSL, facilities provided in forensic science laboratory.

### **BOOKS FOR STUDY AND REFERENCES**

1. B.B. Nanda and R.K. Tiwari, Forensic Science in India: A Vision for the Twenty First Century, Select Publishers, New Delhi (2001).
2. M.K. Bhasin and S. Nath, Role of Forensic Science in the New Millennium, University of Delhi, Delhi (2002).
3. S.H. James and J.J. Nordby, Forensic Science: An Introduction to Scientific and Investigative Techniques, 2nd Edition, CRC Press, Boca Raton (2005)
4. W.G. Eckert and R.K. Wright in Introduction to Forensic Sciences, 2nd Edition, W.G. Eckert (ED.), CRC Press, Boca Raton (1997).
5. R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004).

**SEMESTER – IV**  
**CORE -VII**  
**ACCIDENT INVESTIGATION**

**UNIT I Motor Vehicle Accidents**

Accident scene. Sources of forensic information. Eyewitness accounts. Extent of vehicle damage. Visibility conditions. Photographs of accident site.

**UNIT II**

Estimation of speed. Tire marks, skid marks, scuff marks. Maintenance of vehicles. Abandoned vehicles. Importance of air bags. Railway accidents.

**UNIT III Accident Analysis**

Pre-crash movement. Post-crash movement. Collision model. Gauging driver's reaction. Occupants's kinematics. Types of injuries resulting from accident.

**UNIT IV**

Biomechanics of injuries. Hit and run investigations. Trace evidence at accident sites. Methods of collection trace evidences in vehicular accident cases and methods of preserving skid marks and tyre marks.

**UNIT V Tachographs**

Forensic significance of tachograph data. Tachograph charts. Principles of chart analysis. Accuracy of speed record. Tire slip effects. Falsification and diagnostic signals. Route tracing.

**BOOKS FOR STUDY AND REFERENCES**

1. T.S. Ferry, Modern Accident Investigation and Analysis, Wiley, New York (1988).
2. D. Lowe, The Tachograph, 2nd Edition, Kogan Page, London (1989).
3. T.L. Bohan and A.C. Damask, Forensic Accident Investigation: Motor Vehicles, Michie Butterworth, Charlottesville (1995).
4. S.C. Batterman and S.D. Batterman in Encyclopedia of Forensic Sciences, Volume 1, J.A. Siegel, P.J. Saukko and G.C. Knupfer (Eds.), Academic Press, London (2000).

## **SEMESTER – IV**

### **ALLIED – II**

## **CYBER CRIMES**

### **UNIT I Computer and Internet basics**

Computer Hardware & Networks: The BIOS and Boot Process - Computer Memory - Hard Disks, Floppy Disks, CD ROMs and DVDs - Networks and Communications - Understanding the Internet: How the Domain Name System works - Email Concepts - World Wide Web concepts - Website Creation, Concepts, Interactivity, and Database Driven Web Sites - E Commerce. Concept of mobile money, fraudulent activities in mobile money and identify theft related cases.

### **UNIT II Cyber Crime**

Cyber crime: Definition – History and evolution, Types and forms of cyber crimes - Malicious Code - Computer Viruses, Computer Worms, Computer Trojans, Web Hacking, Foot printing, Port Scanning, E-Shoplifting, Web Defacement, Denial of Service Attacks, Manipulating Cookies - Email Hacking: Email Hacking using Packet Sniffers, Email Hacking & Phishing, Email Frauds & Phishing, Email Bombing Email Hijacking - Social Engineering and cyber crime.

### **UNIT III Cyber Crime Investigation**

Best Practices for Cyber Crime Investigation: Initialising a Search and Seizure Operation, Tracking & Tracing Emails, Recovery of Digital Evidence, Setting up a Cyber Crime Investigation Cell. Cyber Forensics: Basic Forensic Principles, Forensic Imaging & Verification, Data Recovery and Analysis

### **UNIT IV Cyber Law**

Case studies USA, UK and India. Cyber terrorism - Prevention and detection of cyber crime – Cyber Policing - Current statutes in India: Penalties & Offences under the Information Technology Act, 2000, Offences under the Indian Penal Code, 1860, Issues relating to investigation and adjudication of cyber crimes in India - Digital evidence

### **UNIT V Intellectual property rights**

Intellectual Property Issues and Cyberspace – The Indian Perspective: Overview of Intellectual Property related Legislation in India, Copyright law & Cyberspace Trademark law & Cyberspace. Digital Delivery of Intellectual Property Services

### **BOOKS FOR STUDY AND REFERENCES**

1. Albert J. Marcellaa and Robert S. Greenfiled (Ed) (2002) Cyber Forensics, A Field Manual for collecting, examining and preserving evidence of computer crimes, Auerbach publications.
2. Derek Atkins et. al., (1997). Internet Security: Professional Reference, Techmedia, Daryaganj, New Delhi
3. Seymour Goodman and Abraham Soafer (ed.) (2002) The Transnational dimensions of cyber crime, Hoover Institution Press Washington.
4. IT Act 2000.



**SEMESTER – IV**  
**SBEC-II**  
**INTRODUCTION TO BIOMETRY**

**UNIT I Fundamental Aspects**

Definition, characteristics and operation of biometric system. Classification of biometric systems – physiological and behavioral.

**UNIT II**

Strength and weakness of physiological and behavioral biometrics. Multimodal biometrics. Key biometric processes – enrollment, identification and verification.

**UNIT III Introduction to Biometry**

Positive and negative identification. Types of error after positive and negative identification. Performance measures used in biometric systems – FAR, FRR, GAR, FTA, FTE and ATV. Biometric versus traditional technologies.

**UNIT IV Physiological Biometrics**

Fingerprints, palm prints, iris, retina, geometry of hand and face.

**UNIT V Behavioral Biometrics**

Handwriting, signatures, keystrokes, gait and voice.

**BOOKS FOR STUDY AND REFERENCES**

1. S. Nanavati, M. Thieme and R. Nanavati, Biometrics, Wiley India Pvt. Ltd. (2002).
2. P. Reid, Biometrics for Network Security, New Delhi (2004).
3. J.R. Vacca, Biometric Technologies and Verification Systems, Butterworth-Heinemann, Oxford (2007).

**SEMESTER – IV**  
**SBEC-II**  
**GUIDANCE AND COUNSELING**

**UNIT I Introduction to Guidance**

Introduction to Counselling: Meaning, Definition, Need and Importance of counselling and professional ethics in counselling.

**UNIT II Principles of Counseling**

Basic Principles of Counselling: Participation, Individualization, Confidentiality, communication, acceptance, self confidence, self awareness and other principles governing the counselling relationship.

**UNIT III Types of Counseling**

Types of Counselling- Individual, Group & Family Counselling, Counselling process, Interview and its significance in counselling - Use of observation in counselling and understanding of emotions in counselling. Qualities of a Counsellor

**UNIT IV Techniques of Counseling**

Opening Techniques, Reflection of feelings, Acceptance technique, structuring techniques, silence as a technique, leading technique, interpretation technique, Techniques of group counselling, strategies and structure - barriers to effective counselling sessions; Counselling evaluation.

**UNIT V Specialized Counseling**

Premarital and post marital counselling, Counselling children, counselling old people, Interpersonal conflict management, counselling AIDS patients, Counselling for De-addiction - Effectiveness of counselling and guidance in the treatment of offenders and victims.

**BOOKS FOR STUDY AND REFERENCES**

1. Beck, A T. (1976) Cognitive therapy and the emotional disorders, International Universities Press, New York.
2. Corey, G. (1986) Theory and practice of counseling and psychotherapy, Monterey: Brooks/Cole
3. Corsini, R. J. (Ed) (1984) Current Psychotherapies, Itasca, Ill: peacock
4. Davison, G. C., and Neale, J. M. (1986) Abnormal Psychology, Wiley, New York

5. Godfried, M. R. (Ed) (1982) Converging themes in psychotherapy: Trends in psychodynamic humanistic and behavioural practice, Springer, New York.

## **SEMESTER – IV**

### **NMEC-II**

#### **DIGITAL AND CYBER FORENSIC**

##### **UNIT I**

**Cyber Forensics Investigation**—Introduction to Cyber Forensic Investigation, Investigation Tools, eDiscovery, Digital Evidence Collection, Evidence Preservation, E-Mail Investigation, E-Mail Tracking, IP Tracking, E-Mail Recovery, Encryption and Decryption methods, Search and Seizure of Computers, Recovering deleted evidences, Password Cracking.

##### **UNIT II**

**Technical issues** – Security Technologies: Certification and key Distribution, Digital Signature Protocols for Transactions, SSLSecure Socket Layer, SET-Secure Electronic Transaction

##### **UNIT III**

**Security Issues** –Types of Attacks(Active and Passive) Stealing Passwords, Social Engineering, Bugs and Backdoors, Illegal accessing, Authentication Failures, Protocol Failures, Information Leakage, Viruses and Worms, Denial-of- Service, etc. – Firewalls, Packet Filters, Application-Level Filtering, Circuit- Level Gateways, Dynamic Packet Filters, Distributed Firewalls; Digging for Worms, Packet Filtering, Implementing policies (Default allow, Default Deny) on proxy, etc.

##### **UNIT IV**

Introduction to Cyber Security, Implementing Hardware Based Security, Software Based Firewalls, Security Standards, Threats, crimes, etc.; Why require a security? Picking a Security Policy, Strategies for a Secure Network, The Ethics of Computer Security, Security Threats, and levels, Security Plan (RFC 2196)

##### **UNIT V**

##### **Cryptography Techniques**

Introduction to Cryptography, Types of Cryptographic Algorithms(Secret Key Cryptography, Public Key Cryptography, Hash Function),Electronic Signature, Steganography, Reversing the Steganographic Process, Manipulating File System, Data Hiding on NTFS with Alternate data Streams.

## **BOOKS FOR STUDY AND REFERENCES**

1. File System Forensic Analysis by Brian Carrier, Publisher: Addison-Wesley Professional
2. Cyber Law & Crimes (IT Act 2000 & Computer Crime Analysis) by Barkha & Ram Mohan, Publisher: Asian Law House, Hyderabad
3. Firewalls and Internet Security: Repelling the Wily Hacker , Second Edition ,Addison
4. E-Commerce: The Cutting Edge of Business by Kamlesh K. Bajaj & Debjani Nag, TataMcGraw Hill
5. Cyberlaw Simplified Vivek Sood, TMG
6. TataMcGraw Hill Reference Cyber Law and E-Commerce, David Baumer, J C Poindexter, TMG.

## **INTERNSHIP**

Students should go for an internship for one month, after the Third semester, to forensic laboratory organization of their choice and submit the report with the work diary in the IV semester.

### **Scheme of Marks**

Report & Work Diary	- 50 Marks
Viva Voce	- 50 Marks
Total	- 100 Marks

**SEMESTER – V**  
**CORE-VIII**  
**FORENSIC BALLISTIC**

**UNIT I Firearms**

History and development of firearms. Classification of firearms. Weapon types and their operation. Firing mechanisms of different firearms.

Internal ballistics – Definition, ignition of propellants, shape and size of propellants, manner of burning, and various factors affecting the internal ballistics: lock time, ignition time, barrel time, erosion, corrosion and gas cutting.

**UNIT II**

External Ballistics – Vacuum trajectory, effect of air resistance on trajectory, base drag, drop, drift, yaw, shape of projectile and stability, trajectory computation, ballistics coefficient and limiting velocity, Measurements of trajectory parameters, introduction to automated system of trajectory computation and automated management of ballistic data.

**UNIT III**

Terminal Ballistics – Effect of projectile on hitting the target: function of bullet shape, striking velocity, striking angle and nature of target, tumbling of bullets, effect of instability of bullet, effect of intermediate targets, influence of range. Ricochet and its effects, stopping power.

**UNIT IV Ammunition**

Types of ammunition. Constructional features and characteristics of different types of cartridges and bullets. Primers and priming compounds. Projectiles. Headstamp markings on ammunitions. Different types of marks produced during firing process on cartridge – firing pin marks, breech face marks, chamber marks, extractor and ejector marks.

**UNIT V Firearm Evidence**

Matching of bullets and cartridge cases in regular firearms. Identification of bullets, pellets and wads fired from improvised, country made firearms. Automated method of bullet and cartridge case comparison. Determination of range of fire and time of fire.

Mechanisms of formation of gunshot residues. Methods of analysis of gunshot residues from shooting hands and targets, with special reference to clothings.

Identification and nature of firearms injuries. Reconstruction with respect to accident, suicide, murder and self defence.

## **BOOKS FOR STUDY AND REFERENCES**

1. B.J. Heard, Handbook of Firearms and Ballistics, Wiley and Sons, Chichester (1997).
2. W.F. Rowe, Firearms identification, Forensic Science Handbook, Vol. 2, R. Saferstein (Ed.), Prentice Hall, New Jersey (1988).
3. A.J. Schwoeble and D.L. Exline, Current Methods in Forensic Gunshot Residue Analysis, CRC Press, Boca Raton (2000).
4. E. Elaad in Encyclopedia of Forensic Science, Volume 2, J.A. Siegel, P.J. Saukko and G.C. Knupfer (Eds.), Academic Press, London (2000).

**SEMESTER – V**  
**CORE-IX**  
**FORENSIC TOXICOLOGY**

**UNIT I Basics of Toxicology**

Significance of toxicological findings. Techniques used in toxicology. Toxicological analysis and chemical intoxication tests. Postmortem Toxicology. Human performance toxicology.

Dose-response relationship. Lethal dose 50 and effective dose 50.

**UNIT II Poisons**

Classification of poisons. Physico-chemical characteristics and mode of action of poisons. Accidental, suicidal and homicidal poisonings. Signs and symptoms of common poisoning and their antidotes. Collection and preservation of viscera, blood and urine for various poison cases.

**UNIT III**

Identification of biocides and metal salts in body fluids. Metabolism and excretion of poisons. Application of immunoassays in forensic work. Animal poisons. Snake venom. Mode of action. Carbon monoxide poisoning. Vegetable poisons. Poisonous seeds, fruits, roots and mushrooms. Beverages. Alcoholic and non-alcoholic illicit liquors. Analysis and identification of ethyl alcohol. Estimation of ethyl alcohol in blood and urine. Proof spirit. Crime scene management in illicit liquor cases.

**UNIT IV Narcotics, Drugs and Psychotropic Substances**

Definition of narcotics, drugs and psychotropic substances. Broad classification – Narcotics, stimulants, depressants and hallucinogens. General characteristics and common example of each classification. Natural, synthetic and semi-synthetic narcotics, drugs and psychotropic substances.

Designer drugs. Tolerance, addiction and withdrawal symptoms of narcotics, drugs and psychotropic substances. Crime scene search for narcotics, drugs and psychotropic substances – searching a suspect, searching a dwelling, searching a vehicle.

## **UNIT V**

Clandestine drug laboratories. Collection and preservation of drug evidence. Testing of narcotics, drugs and psychotropic substances.

Isolation techniques for purifying narcotics, drugs and psychotropic substances – thin layer chromatography, gas-liquid chromatography and high performance liquid chromatography. Presumptive and screening tests for narcotics, drugs and psychotropic substances. Microcrystalline testing of drugs of abuse. Analysis of narcotics, drugs and psychotropic substances in breast milk, saliva, urine, hair and antemortem blood.

Drugs and driving. Dope tests.

Analysis of narcotics, drugs and psychotropic substances in postmortem blood. Postmortem changes affecting the analysis of narcotics, drugs and psychotropic substances.

## **BOOKS FOR STUDY AND REFERENCES**

1. R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004).
2. F.G. Hofmann, A Handbook on Drug and Alcohol Abuse, 2nd Edition, Oxford University Press, New York (1983).
3. S.B. Karch, The Pathology of Drug Abuse, CRC Press, Boca Raton (1996).
4. A. Poklis, Forensic toxicology in, Introduction to Forensic Sciences, 2nd Edition, W.G. Eckert (Ed.), CRC Press, Boca Raton (1997).
5. A.W. Jones, Enforcement of drink-driving laws by use of per se legal alcohol limits: Blood and/or breath concentration as evidence of impairment, Alcohol, Drug and Driving, **4**, 99 (1988).
6. W.J. Tilstone, M.L. Hastrup and C. Hald, Fisher's, Techniques of Crime Scene Investigation, CRC Press, Boca Raton (2013).



**SEMESTER – V**  
**CORE - IX**  
**FORENSIC DERMATOGLYPHICS**

**UNIT I Basics of fingerprinting**

Introduction and history, with special reference to India.

Biological basis of fingerprints. Formation of ridges. Fundamental principles of fingerprinting.

**UNIT II**

Types of fingerprints. Fingerprint patterns. Fingerprint characters. Plain and rolled fingerprints.

Classification method for fingerprint record keeping. Automated Fingerprint Identification System.

**UNIT III Development of Fingerprints**

Latent prints. Constituents of sweat residue. F

Latent fingerprints' detection by physical and chemical techniques.

**UNIT IV**

Mechanism of detection of fingerprints by different developing reagents.

Application of light sources in fingerprint detection. Preservation of developed fingerprints.

**UNIT V Other Impressions**

Importance of footprints. Casting of foot prints, Electrostatic lifting of latent foot prints.

Lip prints - Nature, location, collection and examination of lip prints. Ear prints and their significance.

Palm prints and their historical importance.

**BOOKS FOR STUDY AND REFERENCES**

1. J.E. Cowger, Friction Ridge Skin, CRC Press, Boca Raton (1983).
2. D.A. Ashbaugh, Quantitative-Qualitative Friction Ridge Analysis, CRC Press, Boca Raton (2000).

3. C. Champod, C. Lennard, P. Margot and M. Stoilovic, Fingerprints and other Ridge Skin Impressions, CRC Press, Boca Raton (2004).
4. Lee and Gaensslen's, Advances in Fingerprint Technology, 3rd Edition, R.S. Ramotowski (Ed.), CRC Press, Boca Raton (2013).

**SEMESTER – V**  
**ELECTIVE – I**  
**SEROLOGY AND DNA TYPING**

**UNIT I**

**Foresic Serology I** Determination of human and animal origin from bones, hairs, nails, skin, body tissue, fluids / strains viz. blood, menstrual blood, semen, saliva, sweat, pus, vomit, etc., through immune diffusion..

Serogenetic markers:- Blood groups – biochemistry and genetics of ABO, Rh, Mn systems, Lewis antigen, Bombay Blood group ,determination of secretor / non secretor.

**UNIT II**

**Foresic Serology II** Polymorphic enzymes typing – PGM, ESD, AK, , etc., and their forensic significance, HLA typing, paternity disputes etc.

**UNIT III**

1. **Genetics**-Human Genome
2. **Deoxyribose Nucleic Acid** – Structural properties Sources of DNA evidence
3. **DNA Extraction**-Basic Principles -Method of DNA extraction
4. **DNA Quantification** -Slot Blot Assay , Southern /Northern Blotting
5. **DNA Amplification** by Polymerase Chain Reaction
6. **DNA data basing**

**UNIT IV**

**Forensic DNA Typing** - Polymorphism in DNA system – DNA markers RFLP, RAPD, VNTRs, SNP, Autosomal – STR, Y-STR, Mitochondrial DNA. Touch DNA. Application in disputed paternity cases, child swapping, Missing person's identity – immigration, veterinary & wild life and Agriculture cases

## **UNIT V**

**Report Writing:** DNA data base, DNA data basing Role of DNA typing in identifying unrecognizable bodies.

**Legal perspectives** – legal standards for admissibility of DNA profiling, procedural and ethical concerns, status of development of DNA profiling in India and abroad.

## **BOOKS FOR STUDY AND REFERENCES**

1. J.M. Butler, Forensic DNA Typing, Elsevier, Burlington Academic Press 2nd Edition (2005).
2. K. Inman and N. Rudin, An Introduction to Forensic DNA Analysis, CRC Press, Boca Raton 2nd Edition (1997).
3. H. Coleman and E. Swenson, DNA in the Courtroom: A Trial Watcher's Guide, GeneLex Corporation, Washington (1994).
4. W.J. Tilstone, M.L. Hastrup and C. Hald, Fisher's, Techniques of Crime Scene Investigation, CRC Press, Boca Raton 8th Edition (2013).

## **SEMESTER – V**

### **CORE X**

#### **FORENSIC SCIENCE PRACTICAL**

Preparation of FIR pertaining to murder case, SC /ST Atrocities (Prevention) Act Posco Act. Preparation of criminal court hierarchical list with cognizance taken .Special courts and its importance Investigation – flow chart preparation, Role of different branches of forensic scientists in murder cases involving stab, firearm, strangulation-smothering, explosive during investigation of & trial.

Preparing chart of chain of possession of material objects. Prepares draft scenes (5numbers) involving locards principles of exchange.

**SEMESTER – VI**  
**CORE XI**  
**PRIVATE DETECTIVE AND INVESTIGATION**

**UNIT I Introduction**

Introduction to Investigation – Process of Investigation in CrPc - Difference between Police and Private Investigator – Desirable attributes of Investigator

**UNIT II Surveillance**

Undercover Operations – Surveillance : Purpose, Pre-surveillance Conference, Covert and overt Surveillance, Automobile Surveillance, Foot Surveillance, Team Surveillance

**UNIT III Types of Investigation**

Pre and Post Marital Investigation – Land Dispute investigation – Student Investigation, Kidnapping and abduction investigation – missing person investigation – Traffic accident investigation Pre & Post employment verification.

**UNIT IV Instruments used in Investigation**

Audio recording devices – Video recording devices- Photo camera.

**UNIT V Interrogation and Interview**

Difference between interrogation and Interview – Uses of Interviews and Interrogations – Types of witnesses.

**BOOKS FOR STUDY AND REFERENCES**

1. Angela Woodhull (2002) Private Investigation: Strategies and Techniques, Texas: Thomas Investigative Publications.
2. Bill Copeland (2001) Private Investigation: How to be successful, Absolutely zero loss Inc.
3. Douglas Cruise (2002) The Business of Private Investigations, Texas:

Thomas Investigative Publications.

4. W. John George Moses (2004) Materials for Diploma in Private Investigation, Institute of Intelligence and Investigation, Eagle's Eye Detective Agency, Chennai
5. Louis and Lawrence (1999) Investigations: 150 Things, Butter worth – Heinemann.
6. Michael Corun (2003) Training Manual on Private Investigation, Texas: Thomas Investigative Publications.
7. Rojer J. Willand (1997) PI: Self study guide on becoming a private detective, Paladin press.

## **SEMESTER – VI**

### **CORE XII**

#### **INTRODUCTION TO RESEARCH METHODOLOGY**

##### **UNIT I**

**Introduction**-Definitions and types of research; Research process and steps in conducting research; Applications of Research. Ethical issues in conducting research.

##### **UNIT II**

**Research Modeling**- Types of Data, Data collection methods- Survey method, Observation method, Experimentation; Scaling techniques; types of sampling, steps in sampling, advantage and limitations of sampling

##### **UNIT III**

**Application of Statistical tools** -Measures of Central tendency – Mean, Median, Mode; Introduction of Probability Theories and Concepts, Probability Distributions- Discrete and Continuous Probability Distributions; Measures of Association: Correlation and regression

##### **UNIT IV**

**Data Analysis Techniques**--Quantitative and qualitative methods of data analysis; Hypothesis Testing - Parametric tests (Z-test, t-test, F-test) and Non-parametric Tests (Chi-Square Test, ANNOVA), Tests of significance based on normal distributions; association of attributes.

##### **UNIT V**

**Report Writing** --Report generation, report writing, and APA format – Title page, Abstract, Introduction, Methodology, Results, Discussion, References, and Appendices.

#### **BOOKS FOR STUDY AND REFERENCES**

1. Mausner & Bahn: Epidemiology-An Introductory text, 2nd Ed., (1985) W. B. Saunders Co.
2. Richard F. Morton & J. Richard Hebd: A study guide to Epidemiology and Biostatistics, 2nd Ed.(2012), University Park Press, Baltimore.

3. Sylvia W Smoller, J Smoller, Biostatistics & Epidemiology A Primer for health and Biomedical professionals, 4th edition, Springs, 2015.

## **SEMESTER – VI**

### **CORE XIII**

#### **HAND WRITING IDENTIFICATION & RECOGNITION**

##### **UNIT I Nature and Scope of Questioned Documents**

Definition of questioned documents. Types of questioned documents. Preliminary examination of documents.

Basic tools needed for forensic documents' examination – ultraviolet, visible, infrared and fluorescence spectroscopy, photomicrography, microphotography, visible spectral comparator, electrostatic detection apparatus.

Determining the age and relative age of documents.

##### **UNIT II Comparison of Documents**

Comparison of handwriting. Development of individuality in handwriting. Natural variations and fundamental divergences in handwritings. Class and individual characteristics.

##### **UNIT III**

Merits and demerits of exemplar and non-exemplar samples during comparison of handwriting. Standards for comparison of handwriting.

Comparison of paper, ink, printed documents, typed documents, Xeroxed documents.

##### **UNIT IV Forgeries**

Alterations in documents, including erasures, additions, over-writings and obliterations.

Indented and invisible writings. Charred documents.

##### **UNIT V**

Examination of counterfeit Indian currency notes, passports, visas and stamp papers.

Disguised writing and anonymous letters.

Significance of handwriting in crime scene, suicide notes and its types, methods of preserving handwriting evidences in crime scene.

### **BOOKS FOR STUDY AND REFERENCES**

1. O. Hilton, Scientific Examination of Questioned Documents, CRC Press, Boca Raton (1982).
2. A.A. Moenssens, J. Starrs, C.E. Henderson and F.E. Inbau, Scientific Evidence in Civil and Criminal Cases, 4th Edition, Foundation Press, New York (1995).
3. R.N. Morris, Forensic Handwriting Identification: Fundamental Concepts and Principles, Academic Press, London (2000).
4. E. David, The Scientific Examination of Documents – Methods and Techniques, 2nd Edition, Taylor & Francis, Hants (1997).

## **SEMESTER – VI**

### **ELECTIVE II**

### **CONTEMPORARY FORMS OF CRIME**

#### **UNIT I White Collar Crime**

Nature, meaning, and forms - Tax evasion - Import/export violations - Insurance frauds - Misbranding and adulteration - Corporate crimes

#### **UNIT II Organized Crime Syndicates**

Nature, meaning and forms - Criminal syndicates - Organized crimes: Regional and international linkages - Problems of identification, investigation and prosecution - Prevention and control strategies. Drug Smuggling, Substance Abuse

#### **UNIT III Political Crimes: Terrorism and Communal Violence**

Terrorism: Nature, meaning and forms - Types of terrorism - Narco-terrorism and Bio- terrorism - National and international roots of terrorism. Communal Violence: Historical Perspective – Communal violence in Post independence India – Babri masjid Demolition – Bombay and Gujarat Riots

#### **UNIT IV Cyber Crimes**

Nature, meaning, definition, forms and etiology - Copyright violation of soft ware - Internet frauds – Cyber Pornography – IT Act 2000 – SMS and MMS Stalking - Prevention, detection and prosecution of cyber criminals



## **UNIT V Women and Child Trafficking**

Magnitude of Women and Child trafficking: – National and International - Methods and Techniques of Traffickers - Push and Pull factors of Trafficking – Prostitution - Sexual exploitation of girl children - Policy and Law – Role of NGO's in the prevention of Women and child trafficking. Role of Interpol in the prevention and investigation of Women and child trafficking.

### **BOOKS FOR STUDY AND REFERENCES**

1. Attar Chand, 1988, Terrorism: Political Violence and Security of Nations, Gian Publishing House, New Delhi.
2. Bologna, Jack, 1984, Corporate Fraud, Butterworth Publishers
3. Gandhirajan, C K 2004, Organised crime, A P H Publishing Corporation
4. Ghosh, S K, 1991, Indian Mafia, Ashish Publishing House
5. Karan Raj, 2002, Dictionary of Terrorism and Bioterrorism, IVY Publishing House, Delhi.
6. Mc Graw Hills Inc New Yk, 1992, Combating Computer Crime: Prevention, Detection and Investigation.
7. Mishra, Girish, 1998, White-collar Crimes, Gyan Publishing House, New Delhi
8. Nair, P M 2002, Combating Organized crime, Konark Publishers
9. Rakesh, M, 1994, Computer Crimes : Concept, Control and Prevention. Goyal Sysman Computers Pvt Ltd. Bombay.
10. Singh B.V., (1993) Communal Violence, Rawat Publications New Delhi.
11. Sachdeva, Updesh Singh, 1987, Frauds & Bankers, UDH Publishing House

**SEMESTER – VI**  
**VIVA-VOCE**  
**PROJECT WORK**

**Objectives:**

The objective of research is to seek answers to problems through application of scientific methodology which guarantees that information collected is reliable and unbiased. This information is utilised to make conclusions and recommend solutions. The elements that are to be kept in mind while undertaking research is deciding a relevant topic, feasibility, coverage, accuracy and research, objectivity and ethics.

Students will work closely with their supervisor and develop mutually working relationship to initiate the research which would involve preparing an outline and preliminary collection of data. The supervisor will guide the student in framing and planning the research project and the methodology to be adopted in collection of data, through interviews, telephones, mailers etc. while the student on their part will expose themselves to research of the topic through meetings, interviews, internet search, library etc. The student should generally produce all material in word processed or typed format so that the presentation is neat and legible. Student must inform their supervisor or other people with whom their work is being discussed. The research should be planned to minimize time wastage and a clear time scale should be put in place. The research should really spell out the objective, its findings, the methodology adopted, its conclusions and recommendations. The student and supervisor will work together to prepare synopsis of the research.

One hour per week has been allocated for the purpose and students alongwith the supervisor must regularly interact during this period. The final preparation and presentation would be done before a panel of internal and external examiners through a report and viva voce.

#### **SCHEME OF EVALUATION**

Pre-preparation of the project / Attendance - 25 marks

Viva-Voce - 25 marks

Project report - 50 marks

**TOTAL MARKS 100 MARKS**