The Tamil Nadu Dr.Ambedkar Law University

தமிழ்நாடு டாக்டர் அம்பேத்கர் சட்டப் பல்கலைக்கழகம்

State University Established by Act No.43 of 1997

NAAC Accredited



SCHOOL OF EXCELLENCE IN LAW

LL.M. CBCS PATTERN

REVISED SYLLABUS

FROM ACADEMIC YEAR 2026-2027

DEPARTMENT OF CRIME AND FORENSIC

LAW

DEPARTMENT OF CRIME AND FORENSIC LAW

The Department of Crime and Forensic Law of the Tamil Nadu Dr. Ambedkar Law University was established in the Academic Year 2024. The study of Crime and Forensic Law occupies a central position in the modern legal and criminal justice framework. In an era marked by rapid technological advancement, transnational crimes, and complex evidentiary challenges, the intersection of law and forensic science has become indispensable for ensuring effective and ethical justice delivery.

The importance of studying this discipline lies in its interdisciplinary approach, which combines the analytical rigor of legal reasoning with the precision of scientific inquiry. It empowers legal professionals, investigators, and policymakers to comprehend the scientific underpinnings of evidence, thereby strengthening the credibility and reliability of judicial outcomes. A sound understanding of forensic analysis on advanced criminalistics, forensic science institutions and its functioning mechanism, Cyber and digital forensics, contemporary forensic applications such as forensic humanities, Space forensic — enables law graduates to interpret and challenge scientific evidence with accuracy and confidence. This integration enhances the efficiency of criminal investigations, the fairness of trials, and the overall administration of justice.

Furthermore, the study of Crime and Forensic Law promotes critical thinking, ethical awareness, and practical competence, equipping students to address emerging challenges such as environmental violations. It also encourages the application of scientific truth-seeking principles within the framework of human rights and due process, ensuring that justice is not only achieved but seen to be achieved.

In academia and practice alike, Crime and Forensic Law fosters research innovation, policy development, and international collaboration. It contributes to a deeper understanding of crime causation, offender behavior, and evidence-based legal reform. As forensic technologies continue to evolve, legal professionals with expertise in this field are increasingly vital in bridging the gap between scientific discovery and judicial integrity. In essence, the study of Crime and Forensic Law cultivates professionals who are ethically grounded, scientifically informed, and legally proficient—capable of upholding the principles of truth, fairness, and justice in the service of society.

At the advent of new Criminal Law regime, introduction of three new Criminals Laws mandates the understanding of Forensic Science Analysis on Crime and Criminal Justice System. Under the Bharatiya Nagarik Suraksha Sanhita, 2023, u/s. 176(3), the Procedural Law included the Forensic Experts as a functionary of the Law. Introduction of this department opens the contemporary approaches of Criminal Law and activate the students to apply the Criminal Law practically with advanced Science and Technology. This is achieved through a combination of substantive law, judicial precedents and doctrines, customary law and practices, and practical approaches envisaged in 6 Specialized Core Papers, 3 Discipline Specific Elective Papers and 2 Generic Elective Papers which will be studied over 4 Semesters in 2 Years (CBCS System).

THE TAMIL NADU DR.AMBEDKAR LAW UNIVERSITY

BRANCH – XIII

DEPARTMENT OF CRIME AND FORENSIC LAW

LL.M SYLLABUS

SPECIALIZED CORE PAPERS - 06

1. Foundations of Criminal Law and Forensic Sciences
2. Modern Criminalistics and Forensic Methods
3. Investigative Mechanism and Forensic Applications
4. Forensic Science Institutions in Criminal Justice Governance
5. Forensic Analysis of Tool Marks, Trace Marks and Scientific Examination
6. Cyber Forensic and Digital Evidence

DISCIPLINE SPECIFIC PAPERS– 03

1. Forensic Questioned Documents
2. Forensic Humanities and International Human Right Policies
3. Contemporary Forensic Divisions

GENERIC ELECTIVE PAPERS – 02

1. Forensic Criminology including Victimology
2. Wildlife and Environmental Forensics

SUBJECTS IN SEMESTERS

FIRST SEMESTER	**1. Judicial Process** (Common Paper -1) **2. Legal Education and Research Methodology** (Common Paper -2) **3. Foundations of Criminal Law and Forensic Science** (Specialized Core Course - I) **4. Modern Criminalistics and Forensic Methods**

	(Specialized Core Course – II) 5. **Forensic Criminology including Victimology** (Generic Elective Course – I)
SECOND SEMESTER	1. **Constitutional Law: The New Challenges** (Common Paper – III) 2. **Law and Social Transformation in India** (Common Paper – IV) 3. **Investigative Mechanism and Forensic Applications** (Specialized Core Course – III) 4. **Forensic Questioned Documents** (Discipline Specific Elective Course - I) 5. **Applied Research Methodology**
THIRD SEMESTER	1. **Forensic Science Institutions in Criminal Justice Governance** (Specialized Core Course – IV) 2. **Forensic Analysis of Tool Marks, Trace Marks and Scientific Examination** (Specialized Core Course – V) 3. **Forensic Humanities and International Human Right Policies** (Discipline Elective Course – II) 4. **Wildlife and Environmental Forensics** (Generic Elective Course – II)
FOURTH SEMESTER	1. **Cyber Forensic and Digital Evidence** (Specialized Core Course – VI) 2. **Contemporary Forensic Divisions** (Discipline Specific Elective Course – III) 3. **Skill Enhancement Course** 4. **Dissertation**

SYLLABUS

PAPER –I

FOUNDATIONS OF CRIMINAL LAW AND FORENSIC SCIENCES

(Specialized Core Paper)

Objectives of the Course

The course "Foundations of Criminal Law and Forensic Sciences" is intended to provide the learners with a comprehensive understanding of the fundamental principles of criminal law and the scientific methods employed in forensic investigations. It seeks to acquaint the students with the interrelationship between law, crime investigation, forensic institutions, and the criminal justice system. The course aims to develop analytical and interdisciplinary knowledge regarding the role of forensic science in the detection, investigation, and adjudication of crimes. It also intends to enhance students understanding of fundamentals of forensic evidence, investigative procedures, and the functioning of criminal justice agencies in India. Further, the course encourages critical thinking, research aptitude, and practical orientation in emerging areas of criminal law and forensic sciences while promoting awareness of ethical standards, human rights concerns, and legal safeguards in forensic practices and criminal justice administration. In addition, the course aims to inculcate the methodology of scientific application in legal procedures.

This course will help the students to

- To introduce students to the fundamental principles, concepts, and theories of criminal law and forensic sciences.
- To develop an understanding of the relationship between criminal law, crime investigation, and scientific methods of evidence analysis.
- To familiarize learners with the structure and functioning of criminal justice institutions, investigative agencies, and forensic laboratories.
- To enable students to appreciate the role of forensic science in the detection, investigation, and adjudication of crimes.

COURSE OUTLINE

Module I: Introduction to Criminal Law

a) Nature and Scope of Criminal Law
b) Substantive Criminal Justice System
c) Procedural and Evidentiary Legal Mechanism
d) Supplementary Criminal Justice Mechanism

Module II: Introduction to Forensic Sciences

a) History and Progressive Development
b) Significance of Forensic Science in Criminal Justice Delivery System
c) Legal Frameworks on Forensic Sciences

d) Forensic and Crime Investigation

Module III: Principles of Forensic Science

a) Nature and Scope of Forensic Science Principles
b) Basic Principles of Forensic Science
c) Significance of Locard's Principle of Exchange
d) Identification and Individualization on Forensic Analysis

Module IV: Forensic Divisions

a) Forensic Biology & DNA Analysis
b) Forensic Chemistry & Toxicology
c) Forensic Medicines & Anthropology
d) Digital Forensic

Module V: Relationship between Law and Forensics

a) Admissibility of Forensic Evidence
b) Expert Availability and admissibility of Testimony
c) Judicial Intervention and Activism on Scientific Analysis
d) Constitutional Validity on Forensic Examinations.

Recommended Readings
Books:

1. Kiely, Terrence F. (2006) "*Forensic Evidence: Science and the Criminal Law*", 2nd Ed, CRC Press/Taylor & Francis, ISBN: 978-0-8493-2858-9
2. Houck, M. M., & Siegel, J. A. (2009) "*Fundamentals of Forensic Science*", 2nd Ed., Academic Press, eBook ISBN: 9780080961651.
3. Jay A. Siegel, Mirakovits, Kathy M. (2022) "*Forensic Science the Basics*" 3rd Ed., CRC Press/Taylor & Francis. eBook ISBN9780429256783
4. Nemeth, C.P. (2023). "*Forensic Law Casebook: Judicial Reasoning and the Application of Forensic Science in Criminal Cases"*,1st Ed., CRC Press/ Taylor & Francis, ISBN: 978-1-032-21174-9
5. Fraser, Jim & Williams, Robin, (2013) *Handbook of Forensic Science*, Routledge Publications, ISBN: 978-1-84392-312-1
6. Allen, M. (2013) *Textbook on criminal law*. Twelfth Edition, Oxford University Press, ISBN: 978-0-19-966929-5
7. Marsh, I., Melville, G., Morgan, K., Norris, G., & Walkington, Z. (2007). *Theories of Crime*. Routledge Publications, eBook ISBN9780203030516
8. Bayens, G. J., & Roberson, C. (2017) *Criminal Justice Research Methods: Theory and Practice*, 2nd Ed., Routledge Publications, eBook ISBN9780429252310
9. Bell, S. (2025). *Forensic Science: An introduction to Scientific and Investigative Techniques* 6th Ed., CRC Press, ISBN: ISBN 9781032525211.
10. Hall, A. B., & Saferstein, R. (2020). *Forensic Science Handbook*, Volume I, 3rd Ed., CRC Press, ISBN: 978-1-4987-2019-9

Articles:

1. Rodrigues, Caio Henrique Pinke, Maria Eduarda Azambuja Amaral, Lívia Salviano Mariotto, Jade Simões Castro, Marina Enriquetto Mascarelli, Jesus Antônio Velho, and Aline Thais Bruni (2003), "Forensic Science or Forensic Sciences? Conceptual analysis" *Research, Society and Development*, Vol.11, Issue.12
2. Lynch, M., & Jasanoff, S. (1998). Contested Identities. Social Studies of Science. Vol.28; Issue:5 & 6, SAGE Publications, pp. 675-686
3. Crispino *et el*, (2011), "Forensic science – A true science? *Australian Journal of Forensic Sciences,* Vol.43; Issue 2&3; pp. 157-176
4. Gary Edmond and Kristy Martire (2016), Forensic science in criminal courts: The latest scientific insights, *Australian Bar Review*, Vol.42, Issue.3; pp. 367–384
5. Ricardo Jorge Dinis-Oliveira, (2025), Forensic Science or Sciences? The recognition as an independent science and redefinition of expert practices based on transdisciplinary, *Forensic Sciences Research*, Volume 10, Issue 3, pp.012
6. Koppl, Roger (2005), "How to improve forensic science", *European Journal of Law and Economics,* Vol.20, Issue.3, pp.255-286
7. Iancu, Elena-Ana (2019), "The Contribution of Forensic Science to Establishing the Truth in Criminal Proceedings", *Athens Journal of Law,* Vol.5; Issue.4, pp.457-470
8. Bakhtiar, Handar Subhandi (2024), "The Evolution of Scientific Evidence Theory in Criminal Law: A Transformative Insight", *Media Iuris,* Vol.7; Issue.2, pp.221-240
9. Murphy, Erin (2007), "The New Forensics: Criminal justice, false certainty, and the second generation of scientific evidence", *California Law Review,* Vol.95, pp.721
10. Williams, G. (2022) 'What is Fundamental in Criminal Law?', *Criminal Justice Ethics,* Vol.41; Issue(3), pp. 278–290

Learning Outcomes

Upon successful completion of the course, the students will be able to:

- Explain the basic principles, doctrines, and sources of criminal law and forensic sciences.
- Analyze the role of forensic science in criminal investigation and administration of justice
- Understand the basic principles of Forensic Sciences
- Critically examine the various divisions of Forensic Examinations
- Demonstrate research, analytical, and problem-solving skills in interdisciplinary areas involving law and forensic science

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PAPER – II

MODERN CRIMINALISTICS AND FORENSIC METHODS

(Specialized Core Paper)

Objectives of the Course

The course "Modern Criminalistics and Forensic Methods" is designed to provide the students with a comprehensive understanding of contemporary criminal investigation techniques and the scientific methods employed in forensic examination within the criminal justice system. The course aims to develop conceptual clarity regarding the principles of criminalistics, forensic identification, collection and preservation of evidence, and the application of scientific tools in crime detection and adjudication. It seeks to familiarize students with emerging forensic technologies, digital and cyber forensic practices, medico-legal procedures, and interdisciplinary investigative approaches relevant to modern criminal justice administration. The course further intends to cultivate analytical, research-oriented, and problem-solving skills by encouraging critical evaluation of forensic evidence, expert testimony, and procedural safeguards in criminal trials. The paper also emphasizes ethical responsibility, human rights sensitivity, scientific temper, and professional competence necessary for effective engagement with contemporary forensic and investigative practices at national and international levels.

Upon studying the course, the learners will be able to:

- Understand the foundational concepts, principles, and scope of criminalistics and forensic science in the administration of justice.
- Develop knowledge of scientific methods used in crime scene investigation, evidence collection, preservation, and analysis.
- Examine the application of forensic techniques in the investigation of various crimes, including violent offences, cybercrime, and organized crime.
- Analyse the role of forensic laboratories, expert testimony, and scientific evidence in criminal adjudication.
- Explore emerging trends, ethical concerns, and technological advancements in modern forensic investigation.

COURSE OUTLINE

Module I: Foundations of Criminalistics and Forensic Science

a) Evolution and scope of criminalistics
b) Role of forensic science in the criminal justice system
c) Principles of evidence examination and reconstruction
d) Ethics, professionalism, and scientific responsibility with Interdisciplinary approach

Module II: Crime Scene Investigation and Evidence Management

a) Crime scene documentation and preservation
b) Search, collection, packaging, and chain of custody of evidence
c) Physical, biological, and trace evidence examination
d) Role of Science and Technology in crime scene analysis and Reconstruction

Module III: Forensic Identification and Laboratory Techniques

a) Fingerprint examination, biometric identification and Digital Forensic analysis
b) DNA profiling and biological evidence analysis and blood sample analysis
c) Ballistics, questioned documents, and track mark analysis
d) Toxicology and narcotics examination

Module IV: Forensic Applications in Criminal Investigation

a. Use of forensic science in violent and organized crimes and offences related to sports
b. Forensic approaches to homicide, sexual offences, and cybercrime
c. Investigative interviewing and forensic intelligence
d. Medico-legal aspects of criminal investigation

Module V – Emerging Trends and Contemporary Challenges in Criminalistics

a) Artificial intelligence and automation in forensic science
b) Wildlife, environmental, and financial forensics
c) Challenges relating to admissibility and reliability of evidence
d) Human rights and ethical concerns in forensic practices

Recommended Readings:

Books:

1. Saferstein, R. (2018) *Criminalistics: An Introduction to Forensic Science*, 13th Ed., Pearson Education, ISBN-13: 9780137542512
2. Sharma, B. R. (2014), *Forensic Science in Criminal Investigation and Trials* 6th Ed., Universal Law Publishing, ISBN: 9789388548786
3. Singh, J., & Sharma, N. R. (Eds.). (2020) *Crime Scene Management within Forensic Science*, Springer, ISBN: 978-981-16-6683-4
4. Gardner, R. M., & Krouskup, D. R. (2019) *Practical Crime Scene Processing and Investigation*, 3rd Ed, CRC Press, ISBN: 978-1-138-04778-5.
5. Pyrek, K. (2010) *Forensic Science under Siege: The Challenges of Forensic Laboratories and the Medico-Legal Investigation System*, Elsevier Academic Press, ISBN: 978-0-12-370861-8
6. Touroo, R., Brooks, J. W., Lockwood, R., & Reisman, R. (2018) *Medicolegal investigation.* In Veterinary Forensic Pathology, Vol.1, pp. 1-8, Cham: Springer International Publishing, ISBN: 978-3-319-67172-7

7. Geberth, V. J. (2015) *Practical Homicide Investigation: Tactics, Procedures, and Forensic Techniques*, 5th Ed., Boca Ratan Publishers, CRC Press, ISBN: 9781003095835
8. Ashley, K. D. (2017) *Artificial Intelligence and Legal Analytics*, Cambridge University Press, ISBN: 978-1-107-17150-3
9. Harmon, R. (2005) "*Admissibility Standards for Scientific Evidence*", In Microbial Forensics, pp. 381-392, Academic Press, ISBN: 978-0-12-088483-4
10. Morrison, R. D. (2014) *Environmental Forensics*, 1st Ed., Academic Press, ISBN: 9780849320583

Articles:

1. Morgan, R. M., et al. (2020) "Breaking the barriers between intelligence, investigation and evaluation: A continuous approach to define the contribution and scope of forensic science." *Forensic Science International*, Vol.309
2. Yadav, P. K. (2017). "Ethical Issues across different fields of Forensic Science." *Egyptian Journal of Forensic Sciences*, Vol.7, No:10
3. Kraft, B. B. (1931), "Critical Review of Forensic Ballistics*", American Journal of Police Science*, Vol.2, No.2, pp. 125-142.
4. De Alcaraz-Fossoul, J., & Roberts, K. A. (2017) "Forensic Intelligence Applied to Questioned Document Analysis: A Model and its Application against Organized Crime", *Science & Justice*, Vol.57, No.4, pp. 314-320.
5. Nayyer, S., & Jaiswal, A. K. (2023). "DNA Profiling in Forensic Investigation – A Review." *IP International Journal of Forensic Medicine and Toxicological Sciences*, Vol.8, No.1, pp.14-22
6. Bluth, M. H., & Pincus, M. R. (2016)" Narcotic Analgesics and Common Drugs of Abuse: Clinical Correlations and Laboratory Assessment", *Clinics in Laboratory Medicine*, Vol.36, No.4, pp. 603-634.
7. Chaudhary, B., Shukla, P. K., & Bastia, B. K. "Role of Clinical Forensic Medicine Unit in Quality and Standardization of Medico-Legal Reports."
8. Jain, A. (2023). "Relevance of Medical Opinion in Homicide Cases." *National Journal of Criminal Law*, Vol.6, No.1, pp. 19–26.
9. Smith, S. (1951) "The Medico-Legal Institute and the Problem of Crime", *Medico-Legal Journal*, Vol.19, No.2, pp. 57-68.
10. Shevchuk, V. (2023) "Development Trends in Criminalistics in the Era of Digitalization", *Scientific Collection InterConf*, Vol. 33, No.155, pp. 198–219

Learning Outcomes

Upon successful completion of the course, students will be able to:

- Explain the principles and interdisciplinary nature of criminalistics and forensic science.
- Apply scientific approaches to crime scene examination and evidence management.
- Differentiate between various forensic identification and analytical techniques, including DNA analysis, fingerprinting, toxicology, and digital forensics.

- Critically evaluate the evidentiary value and legal admissibility of forensic evidence in criminal proceedings.
- Assess contemporary challenges and innovations in forensic science with reference to ethics, human rights, and technological developments.

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PAPER - IV

FORENSIC SCIENCE INSTITUTIONS IN CRIMINAL JUSTICE GOVERNANCE

(Specialized Core Paper)

Objectives of the Course:

The course "Forensic Science Institutions in Criminal Justice Governance" is designed to familiarize students with the structure, functions, and significance of forensic institutions within the criminal justice system. It seeks to develop a comprehensive understanding of how forensic laboratories, investigative agencies, medico-legal institutions, and regulatory bodies contribute to effective criminal investigation, prosecution, and justice administration. The course also aims to examine the institutional framework governing forensic practices at national and international levels, while highlighting issues of accountability, ethics, professionalism, and technological advancement in forensic governance. Further, it encourages students to critically evaluate the role of forensic institutions in ensuring fair trial standards, evidentiary reliability, and access to justice in contemporary criminal justice administration.

This course will help the students to

- Recognize the fundamentals of Forensic Institutions in India and international level
- Know about the various Forensic Science Institutions and its role, significance in the governance of criminal justice
- Understand the involvement and contributions of multiple investigative agencies in forensic administration
- Familiarize with the international forensic institutions and the coordination between national and international forensic science institutions
- To assess the emerging challenges due to the technological advancement facing by the Forensic Organisation and its possible remedies.

COURSE OUTLINE

Module I: Basics of Forensic Institutions

a) Historical development of forensic science institutions
b) Relationship between forensic institutions and criminal justice administration
c) Institutional framework for scientific investigation
d) Ethics, professionalism, and accountability in forensic services

Module II – National Forensic Institutions and Their Functions

a) Structure and functions of forensic science laboratories
b) Role of medico-legal institutions and autopsy centres
c) Fingerprint bureaus, cyber forensic units, and DNA laboratories
d) Central and State forensic institutions in India

Module III – Investigative and Regulatory Agencies

a) Role of police investigative agencies in forensic administration
b) Coordination between forensic laboratories and investigating officers
c) National investigation and intelligence agencies
d) Regulatory standards governing forensic practices

Module IV – International Forensic Institutions and Cooperation

a) International forensic organizations, standards and networks on investigation
b) Role of INTERPOL and transnational forensic cooperation
c) Comparative forensic institutional models
d) Mutual legal assistance and cross-border evidence sharing

Module V – Emerging Challenges and Reforms in Forensic Administration

a) Technological modernization of forensic institutions
b) Delays, backlogs, and infrastructural challeges
c) Artificial intelligence and digital transformation in forensic institutions
d) Reforms and future directions in forensic governance

Recommended Readings:

Books:

1. Mirakovits, Kathy, Londino-Smolar, Gina (2021), "*The Basics of Investigating Forensic Science: Laboratory Manual*, 2nd Ed, CRC Press, Taylor and Francis Publications, ISBN: 978-0-367-25253-6
2. Tilstone, W. J. (2006), "*Forensic Science: An Encyclopaedia of history, methods, and techniques*", Bloomsbury Publishing USA, ISBN: 1-57607-194-4
3. Misra, G. J., & Damodaran, C. (2010) "*Perspective plan for Indian forensics*", Final Report presented to the Ministry of Home Affairs Government of India New Delhi
4. Badiye, A., Sulke, P., Bhandarkar, M., & Kapoor, N. (2023) "*Forensic Science Laboratories in India*" In Textbook of Forensic Science, Springer Nature Singapore, , pp. 67-98
5. Newburn, T., Williamson, T., & Wright, A. (Eds.). (2012) "*Handbook of criminal investigation*", Willan Publishing Routledge, ISBN: 978-1-84392-188-2
6. Neyroud, P., & Disley, E. (2012) "*The management, supervision and oversight of criminal investigations*", In Handbook of criminal investigation, pp. 549-571, Willan Publications
7. Ubelaker, D. H. (Ed.). (2015) "The Global Practice of Forensic Science", John Wiley & Sons Publications, ISBN: 97811118724163
8. Wilson, T. (2013) "Forensic Science and the Internationalisation of Policing". In *Handbook of Forensic Science,* 1st Ed., Willan Publications, pp. 491-522, ISBN: 9781843927327

9. Agapova, O., & Kolomoiets, T. (2025) "*Strengthening Forensic Science in Ensuring Global Justice*", In Globalization, Global Security, and New International Realities for Modern Democracies, IGI Global Scientific Publishing, pp. 247-268
10. Strom, K. J., & Hickman, M. J. (Eds.). (2014) "*Forensic Science and the Administration of Justice: Critical Issues and Directions*", Sage Publications, ISBN: 978-1-4522-76-88-5

Articles:

1. Linzi Wilson-Wilde (2018) "The international development of forensic science standards — A review", *Forensic Science International*, Vol. 288, pp.1-9
2. Jonakait, R. N. (1991) "Forensic Science: the need for Regulation", *Harvard Journal of Law & Technology,* Vol. 4, No:1, pp.109-192.
3. Prachi Kathane *et el* (2021), "The development, status and future of forensics in India", *Forensic Science International: Reports,* Vol.3, pp.1-5
4. Tewari, RK; Ravikumar, KV (2000) "History and Development of Forensic Science in India", *Journal of Postgraduate Medicine,* Vol.46, No:4, pp. 303-308
5. Sood, A., & Kashyap, S. (2018) "Administration of Criminal Justice and Role of Forensics In India: A Study" *International Journal of Innovative Research and Advanced Studies,* Vol.5, No:4, pp.69-73.
6. Braithwaite, J., Walker, J. And Grabosky, P (1987) "An Enforcement Taxonomy of Regulatory Agencies", *Journal of Law & Policy,* Vol.9, pp. 323-351
7. Shepitko, V. Y., & Shepitko, M. V. (2021) "The role of forensic science and forensic examination in international cooperation in the investigation of crimes" *Journal of the National Academy of Legal Sciences of Ukraine,* Vol.28, No:1, pp.179-186
8. Kliuiev, O. (2021) "International Research Cooperation is effective Mechanism for Forensic Science Improvement" *Archives of Criminology and Forensic Sciences,* Vol.3, pp.34-40.
9. Simakova-Efremian, E. B., Derecha, L. M., & Myasoedov, V. V. (2018) "Actual problems of cooperation with organization of foreign states in the sphere of forensic expert activity", *Theory and Practice of Forensic Science and Criminalistics,* Vol.18, pp. 175-184.
10. Korniev, O., & Alibekiroğlu, S. (2024) "The International Experience in Preventing Service Offences by Forensic Science Authorities' Personnel: Advancing The Legal Framework", *Theory and Practice of Forensic Science and Criminalistics,* Vol. 36, No:3, pp.133-147.

Learning Outcomes:

- Understand the institutional framework of forensic science and its relationship with the criminal justice system.
- Identify the roles and functions of major forensic institutions and agencies involved in investigation, evidence examination, and justice delivery.
- Analyze the contribution of forensic science in criminal investigation, prosecution, and adjudication within modern justice systems.

- Examine the legal and administrative foundations governing forensic institutions at national and international levels.
- Assess contemporary challenges and reforms concerning forensic governance, accreditation, technological advancements, and interdisciplinary coordination.

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PAPER - V

Forensic Analysis of Tool Marks, Trace Marks and Scientific Examination

(Specialised Core Paper)

Objectives of the Course

This course is designed to provide students with a clear understanding of tool marks and trace evidence and their significance in forensic science and criminal investigations. It aims to develop knowledge about the nature, types, identification, and evidentiary value of tool marks created during criminal activities. The course also helps students understand the principles of trace evidence, including the application of Edmond Locard's Exchange Principle in linking suspects, victims, and crime scenes. Students will learn methods for recognition, collection, preservation, packaging, and examination of forensic evidence while maintaining proper chain of custody procedures. The course further introduces scientific techniques such as microscopy, chromatography, spectroscopy, and advanced instrumental methods used in forensic laboratories for analysis and comparison of evidence. In addition, it familiarizes learners with modern developments, digital technologies, and emerging trends in tool mark and trace evidence examination, enhancing their analytical and investigative skills for forensic applications.

After undergoing the study, the student will be able to:

- Understand the concepts, principles, and forensic importance of tool marks and trace evidence in criminal investigation.
- Identify, recognize, collect, preserve, and analyze tool marks and trace evidence using proper forensic procedures.
- Differentiate class and individual characteristics of tool marks and apply methods for matching and individualization.
- Gain knowledge of microscopic, chromatographic, spectroscopic, and advanced scientific techniques used in forensic examination.
- Understand the evidentiary value, challenges, limitations, and emerging trends in tool mark and trace evidence analysis within the criminal justice system.

COURSE OUTLINE

Module I: Tool Marks in Forensic Analysis

a) Importance of tool marks in Criminal Investigation
b) Definition, Nature and Principles of Tool Mark
c) Individual & Class characteristics of Tool marks
d) Recognition of Tool Marks in Crime Scene

Module II: Tool Mark Examination and Analysis

a) Identification of Tools from marks
b) Casting, Collection and Preservation Techniques
c) Matching and Individualization of Tool marks
d) Role of tool mark evidence in linking suspects to crime and Limitations in Tool Mark analysis

Module III: Trace Evidence in Forensic Analysis

a) Importance and Evidentiary Value of Trace evidences in Investigation
b) Meaning and Characteristics of Trace Evidence
c) Types of Traces in forensic
d) Locard's Principle Relation to Traces

Module IV: **Trace Evidence Examination & Techniques**

a) Recognition of Trace Evidence
b) Collection Methods
c) Packaging, Labelling and Chain of custody Procedures of trace Evidence
d) Challenges for expert in Trace Examination

Module V: **Scientific Examination of Tool Marks & Trace Evidence**

a) Microscopic and Chromotographic Technique
b) Advanced Instrumentation
c) Spectroscopic and Spectrometric Techniques
d) Emerging trends in tool mark and trace mark analysis

Recommended Reading

Books

1. Baldwin, D., Birkett, J., Facey, O., & Rabey, G. (2013) "*The Forensic Examination and Interpretation of Tool Marks*", John Wiley & Sons Publications, ISBN: 978-1-119-97245-7
2. Thomson, G., & Black, S. (2017) "*Principles of Tool Mark Analysis and Evidential Best Practice",* In: Criminal Dismemberment, 1st Ed., pp. 79-95, Boca Raton Publisher, CRC Press, ISBN: 9781315373126
3. Kumar, S., Saxena, G., & Gautam, A, Freckelton, Ian (Eds) (2021) "*Forensic analysis and interpretation of Tool Marks*", In: Forensic Analysis: Scientific and Medical Techniques and Evidence under the Microscope, IntechOPen Publisher, London, ISBN: 978-1-83968-950-5
4. Shelton, D. (2010) "*Forensic Science in Court: Challenges in the Twenty First Century*", Rowman and Littlefield Publishers, Bloomsbury Publishing PLC, ISBN: 978-1-4422-0187-3

5. Desiderio, V. J., Taylor, C. E., & Nic Daéid, N. (Eds.). (2020) "*Handbook of Trace Evidence Analysis*", John Wiley & Sons Publication, ISBN: 97811118962114
6. Houck, M. M. (Ed.). (2001) "*Mute Witnesses: Trace Evidence Analysis*", Academic Press, ISBN: 0-12-356760-2
7. Deadman, H, Houck, MM (Eds) (2003) "*The Importance of Trace Evidence*", In. Trace Evidence Analysis: More Cases in Forensic Microscopy and Mute Witnesses, pp. 123-164, Elsevier Publications, ISBN: 0-12-356761-0
8. Bowers, C. M. (2013) "*Forensic Testimony: Science, Law and Expert Evidence*" Academic Press, Elsevier Publications, ISBN: 978-0-12-397005-3
9. Blackledge, R. D. (Ed.). (2007), "*Forensic Analysis on the Cutting Edge: New Methods for Trace Evidence Analysis"* John Wiley & Sons Publications, ISBN: 978-0-471-71644-0
10. Pyrek, K. M. (2017) "*Pioneers in Forensic Science: Innovations and Issues in Practice*", Taylor and Francis Publications, CRC Press, ISBN: 978-1-4987-8529-7

Articles

1. Burd, D. Q., & Greene, R. S. (1948-1949) "Tool mark comparisons in criminal investigations" *Journal of Criminal Law and Criminology*, Vol.39, No:3, pp. 379-391
2. Singh, A., Sharma, M., & Yadav, A. (2026) "A Comparative Study of Examination Techniques for Tool Marks Identification" *International Journal of Forensic Science and Criminology*, Vol.1, No.1, pp. 1-10.
3. Schwartz, A. (2005) "A Systemic Challenge to the Reliability and Admissibility of Firearms and Tool mark Identification" *Columbia Science and Technology Law Review*, Vol.VI, pp.1-42.
4. Nichols, R. G. (2007) "Defending the Scientific Foundations of the Firearms and Tool mark Identification Discipline: Responding to Recent Challenges", *Journal of Forensic Sciences*, Vol.52, No.3, pp. 586-594.
5. Nissan, E. (2009) "Legal Evidence, Police Intelligence, Crime Analysis or Detection, Forensic Testing, and Argumentation: An Overview of Computer Tools or Techniques" *International Journal of Law and Information Technology*, Vol. 17, No.1, pp. 1-82.
6. Kwakye-Nuako, C. O. (2022) "Exploring the Probative Role of Some Underutilized 'Forensic Mark Evidence' in Safe Justice Delivery: A Gold Mine for the Defence Lawyer?" *UCC Law Journal*, Vol. 2, Issue.2, pp. 1-12
7. Sarraf, S. (2023) "Advantages of Modern Fingerprint Techniques in Crime Investigation", *Int. J. Creat. Res. Thoughts* (IJCRT), Vol.11.
8. Mistek, E., Fikiet, M. A., Khandasammy, S. R., & Lednev, I. K. (2018) "Toward Locard's exchange principle: Recent developments in forensic trace evidence analysis", *Analytical Chemistry*, Vol.91, No.1, pp. 637-654.
9. Stoney, D. A., & Stoney, P. L. (2015) "Critical Review of Forensic Trace Evidence Analysis and the need for a New Approach" *Forensic Science International*, Vol.251, pp. 159-170.
10. Lock, A. B., & Morris, M. D. (2013) "Significance of Angle in the Statistical Comparison of Forensic Tool Marks" *Technometrics*, Vol. 55, No.4, pp. 548–561

Learning Outcomes

After successful completion of this course, students will be able to:

- Understand and identify tool marks and trace evidence by explaining their nature, characteristics, evidentiary value, and importance in forensic investigations.
- Apply scientific methods for collection, preservation, and examination of tool marks and trace evidence using appropriate forensic techniques and chain of custody procedures.
- Analyze and compare forensic evidence through microscopic, chromatographic, spectroscopic, and advanced instrumental techniques for individualization and crime scene reconstruction.
- Evaluate the role and limitations of forensic evidence in linking suspects to crimes while understanding emerging trends and technological advancements in tool mark and trace evidence analysis.

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PAPER -VI

CYBER FORENSICS AND DIGITAL EVIDENCE

(Specialised Core Paper)

Objectives of the Course

The objective of this course is to provide students with a comprehensive understanding of Cyber Forensics and its role in modern digital investigations and evidence. It aims to introduce the nature, scope, and significance of cyber forensics in detecting, analyzing, and preventing cybercrimes. The course develops knowledge of cybercrime types, legal frameworks, and the admissibility of digital evidence in judicial systems. It also focuses on equipping learners with practical skills in cyber forensic investigative processes, including crime scene management, evidence collection, imaging, acquisition, and chain of custody procedures. Students will gain hands-on awareness of computer, mobile, network, and cloud forensics, along with techniques for recovering deleted or hidden data and analyzing digital communications. The course further familiarizes learners with advanced forensic tools, AI applications, and emerging trends such as cryptocurrency and dark web investigations. Overall, it prepares students to handle digital evidence effectively and support criminal investigations with technical and legal competence.

After undergoing the study, the student will be able to understand the following:

- The fundamentals of cyber forensics, including its nature, scope, and role in investigating cybercrimes.
- The types of cybercrimes and the legal framework governing digital evidence and its admissibility in court.
- Cyber forensic investigation procedures such as crime scene handling, data acquisition, imaging, and chain of custody.
- Techniques for analyzing computer systems, mobile devices, networks, cloud platforms, and recovering digital evidence.
- The use of modern forensic tools and emerging technologies, along with judicial interpretation and challenges in digital evidence handling.

COURSE OUTLINE

Module I: Cyber Forensics – Nature and Scope

a) Understanding the nature and scope of Cyber Forensics
b) Significance of Cyber Forensic in Criminal Investigations
c) Types of Cyber Crime and Computer Forensic Systems Service
d) Legal Frame work relating to Cyber Crime and Evidence

Module II: Cyber Forensic Investigative Process

a) Cyber Forensic Investigation methodology
b) Crime Scene Management in Cyber-crime Investigations

c) Imaging and Acquisition of Digital data, seizure of digital devices.
d) Documentation and Evidence handling procedures, chain of custody.

Module III: Computer and Mobile Device Forensics

a) Forensic Examination of Computer Systems and Storage Media
b) Recovery and Analysis of Deleted and Hidden Data, Extraction of Data from Smartphones, Tablets, and Portable Devices
c) Mobile Phone Forensics, SIM Card Analysis, Hard disk analysis
d) E-mail and browser forensics, cloud and Social media Forensics, Internet and Network forensic Basics

Module IV: Digital Forensic Tools and Techniques

a) Use of Digital Forensic Software and Investigation Platforms, Fundamentals of Network Traffic Analysis
b) Disk Imaging, Data Carving, Malware Analysis and Cyber Threat Investigation, Email, Web Browser, and Social Media Investigation, Investigation of Cybercrimes in Digital Communication Platforms
c) Artificial Intelligence and Automation in Digital Forensics, Cloud Computing and Cloud Forensic Challenges
d) Documentation, Reporting, and Presentation of Digital Evidence

Module –V: Admissibility and Judicial Interpretation of Digital Evidence

a) Admissibility of electronic and digital evidence, Authentication and Reliability of digital Evidence
b) Cross-Border Cyber Investigations and International Cooperation, Digital Privacy, Data Protection, and Human Rights Concerns
c) Judicial Standards in admitting digital evidence, interpretation of digital evidences
d) Emerging trends in cyber forensic and digital evidence, Cryptocurrency and Blockchain Forensics, Dark Web Investigation and Cyber Surveillance

Recommended Readings

Books:

1. Hummert, Christian, and Dirk Pawlaszezyk, (Eds.). (2022) "*Mobile Forensics – The File Format Handdbook: Common File Formats and File System used in Mobile Devices"*, Springer International Publishing, ISBN – 9783030984670.
2. Naveen Kumar Chaudhary, Archana Patel, Abinash Mishra & Chothmal Kumawat, (2025), "*Artificial Intelligence and Digital Forensics – Advancements, Applications, Challenges and Solutions"*, CRC Press, ISBN 9781032844688.
3. Akashdeep Bharadwaj, Cyber Investigation of Smart Devices, 1st ed., CRC Press, 2024, ISBN 9781032943671.
4. Nhien-An Le-Khac & Kim-Kwang Raymond Choo, (2020), "*Cyber and Digital Forensic Investigations: A Law Enforcement Practitioner's Perspective"*, Springer Nature Switzerland AG, ISBN-13**:** 978-3030471309.

5. Roy, Anket, Rahul Dixit, Ruchira Naskar, and Rajat Subhra Chakraborthy, (Eds.). (2020), "*Digital Image Forensics"*, 1st ed., Springer Nature Singapore, ISBN - 9789811076442.
6. Ghonge, Mangesh M., (2022), "*Cyber Security and Digital Forensics: Challenges and Future Trends Advances"* In Cyber Security*)"*, John Wiley & Sons Inc, ISBN - 9781119795636.
7. Dejey, (2018), "*Cyber Forensics"*, Oxford Publications, ISBN – 13 978-0199489442.
8. Joakim Kavrestad, (2020), *"Fundamentals of Digital Forensics*", 2nd ed., Springer International Publishing, ISBN - 9783030389536.
9. Nilakshi Jain, Dhananjay R. Kalbande, *"Digital Forensic: The Fascinating World of Digital Evidences"*, Wiley Precise Textbook Series, ISBN -13 978-8126565740.
10. Ashwani Kumar and Seelam Sai Satyanarayana Reddy, (Eds.), *"Advancements in Security and Privacy Initiatives for Multimedia Images"*, IGI Global, ISBN -13 9781799827955.

Articles:

1. Munira M. Rampurawala, Anjali R. Vaiagar, (2026), "Role of Cyber Forensic in Crime Investigation" *International Journal of Engineering Research & Technology*, Vol. 14, no.2, pp.1-7.
2. Bourouis, Sami, Roobaca Alroobaca, Abdullah M.Alharbi, Murad Andejany and SaeedRubaiee, (2020), "Recent Advances in Digital Multimedia Tampering Detection for Forensic Analysis", *Symmetry* Vol. 12, no.11, pp.1-26.
3. Apoorva Bhangla and Jahanvi Tuli, (2021), "A Study n Cyber Crime and its Legal Framework in India", *International Journal of Law Management and Humanities*, Vol. 4, no. 2, pp.493 – 504.
4. Hall, Stuat W., Amin Sakzad and Kim-Wang Raymond Choo, (2022), "Explainable Artificial Intelligence for Digital Forensics", *Wiley Interdisciplinary Review*, Vol. 4, no.2, pp.1-11.
5. Ioan Vasile Ticovan and Gheorghe Sebestyen, (2025), "Forensic Investigation of Data Storage Systems, *IEEE Xplore – Springer Publication*, Vol. 17, no.3, pp.1-22.
6. Fran Casino, Claudia Pina, Pablo Lopez-Aguilar and Edgar Batista, (2022), "SOK: Cross-Border Criminal Investigations and Digital Evidence", *Journal of Cybersecurity*, Vol. 8, no.1, pp.1-18.
7. Salih, K. M. M., & Dabagh, N. B. I. (2023) "Digital forensic tools: A Literature Review" *Journal of Education and Science*, Vol. 32, No.1, pp.109-124.
8. Tina Wu *et al* (2020) "Digital forensic Tools: Recent Advances and Enhancing the Status Quo", *Forensic Science International: Digital Investigation*, Vol.34.
9. Fadhel Arjuna Adinda, Ema Rahmawati, and Souad Ezzerouali, (2025), "The Challenge of Admitting Electronic Evidence in Civil Procedure Law", *Journal IUS Kajian Hukum dan Keadilan*, Vol. 13, no.3, pp.656 - 680.
10. Hafiz Omer Abdullah, Mudassir Maqsood and Ahmad Nadeem, (2025), "Digital Evidence in Criminal Proceedings: Legal Standards, Chain of Custody, and Evidentiary Reliability in The Digital Era", *Research Journal for Social Affairs*, Vol. 3, no.5, pp.795-805.

Learning Outcomes

- Explain the fundamental concepts of cyber forensics, its scope, and its importance in combating cybercrime.
- Identify different types of cybercrimes and describe the legal framework governing digital evidence.
- Apply cyber forensic investigation methodologies, including evidence collection, imaging, acquisition, and chain of custody procedures.
- Perform basic analysis of digital evidence from computers, mobile devices, networks, and cloud environments.
- Practise the knowledge of forensic tools and emerging technologies to support investigation, reporting, and interpretation of digital evidence in legal contexts.

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PAPER -VII

FORENSIC QUESTIONED DOCUMENTS

(Discipline Specific Elective Course)

Objectives of the Course

The objective of this course is to provide students with a comprehensive understanding the concept of Questioned Documents in forensic investigations. It aims to introduce the nature, scope, and types of Questioned Documents. The course develops knowledge and skill for forensic investigation of Questioned Documents, techniques for detecting forgeries, alterations and authenticating documents through handwriting, paper, ink and printing analysis. It also intends to enhance students understanding of advanced techniques in Questioned Documents through optical and spectral analysis, chemical and ink analysis and digital forensic document analysis. Emphasis is placed on ethical handling of forensic evidence and professional standards. It also focuses on equipping learners with practical skill in evidence collection, preservation, preparation and presentation of expert testimony in legal proceedings. Further, the course encourages emerging technologies such as Artificial Intelligence, Photometric Stereo and Block Chain Technology and its challenges in Questioned Documents. By end, students will be prepared to contribute effectively to forensic investigations, supporting justice with advanced document examination techniques.

After undergoing the study, the student will be able to understand the following:

- To introduce students to the fundamentals principles of document examination in forensic investigations.
- Nature, scope, types and essential competencies of Questioned Documents.
- Advanced techniques for examination of questioned documents.
- Legal admissibility and role of forensic testimony in legal proceedings.
- The use of emerging technologies and its challenges in examination of Questioned Documents.

COURSE OUTLINE

Module I: Fundamental Concept of Forensic Document Examination

a) Introduction to Forensic Document Examination.
b) Basic Principles of Forensic Document Examination.
c) Nature and Scope of Questioned Documents.
d) Types of Questioned Documents.

Module II: Essential Competencies of Questioned Documents

a) Document Analysis Techniques-Methods of examining handwriting, Signature and typewriting.
b) Detection of Alterations and Erasures-Techniques for detecting alterations and erasures in documents.
c) Detection of Forgery- Types of document forgery and method used for detection of forgery in documents.

d) Document Authentication- Criteria for determining authenticity of documents, Examination of security features and anti-counterfeiting measures.

Module III: Advanced Techniques in Questioned Documents

a) Optical and Spectral Analysis.
b) Chemical and Ink Analysis.
c) Digital Forensic Document Analysis.
d) Ethical Considerations-Ethical guidelines and considerations in document examination, Professional standards for handling confidential documents.

Module IV: Admissibility and Forensic Testimony

e) Legal standards for admitting questioned documents as evidence.
f) Evidence collection and preservation of questioned documents in investigation.
g) Preparation and presentation of expert testimony in legal proceeding.
h) Role of forensic document examiner in legal investigation.

Module –V: Emerging Technologies and Issues in Questioned Documents

a) Role of Artificial Intelligence in document examination.
b) Application of Photometric Stereo in document examination
c) Block Chain Technology in document security.
d) Legal and Ethical issues in emerging technologies.

Recommended Readings

Books:

1. Hilton, O. (1992). *Scientific Examination of Questioned Documents*, CRC Press, ISBN: 978-0-84-939510-9
2. Levinson, J. (2001). *Questioned Documents: A Lawyer's Handbook*. Academic Press, ISBN: 978-0-12-445490-3
3. Seiden, H., & Norwitch, F. (2014). *Forensic Science: An Introduction to Scientific and Investigative Techniques*, ISBN: 978-1-43-985383-2
4. LaPorte, G.M. J.A. Siegel (Ed.) (2015). *Chemical Analysis for the Scientific Examination of Questioned Documents*. In Forensic Chemistry, John Weily & Sons Publications, ISBN: 9781118897720
5. Lewis, J. (2014). *Forensic Document Examination: Fundamentals and Current Trends*. Elsevier, ISBN**:** 978-0-12-416693-6
6. Koppenhaver, K. M. (2007). *Forensic Document Examination: Principles and Practice*. Totowa, NJ: Humana Press, ISBN: 978-1-58-829743-3
7. Smith, F. C., & Bace, R. G. (2003). *A Guide to Forensic Testimony: The Art and Practice of Presenting Testimony as an Expert Technical Witness*. Addison-Wesley Professional, ISBN: 978-0-20-175279-3
8. Houck, M. M. (Ed.). (2018). *Digital and Document Examination*. Elsevier, ISBN**:** 978-0-12-802717-2

9. Ellen, D., Day, S., & Davies, C. (2018). *Scientific Examination of Documents: Methods and Techniques*, 4th Ed., CRC Press, ISBN: 978-1-4987-6803-0
10. Angel, M., & Kelly, J. S. (Eds.). (2020). *Forensic Document Examination in the 21st Century*, CRC Press, ISBN: 978-0-367-25155-0

Articles:

1. Albert. S. Osborn (1940), "The Investigation and Trial of Questioned Document", *Journal of Criminal Law and Criminology,* Vol. 31, No.2, pp.
2. Ling, S. (2002) "A Preliminary Investigation into Handwriting Examination by Multiple Measurements of Letters and Spacing", *Forensic Science International*, Vol. 126, No.2, pp.145-149.
3. Olson, L (1986). "Color Comparison in Questioned Document Examination Using Micro Spectrophotometry", *Journal of Forensic Sciences'*, Vol. 31, No.4, pp. 1330-1340.
4. Mathur, S. (2023). "Questioned Documents Examination-Modern Procedures for Better Efficiency" *Forensic Science and Human Rights,* NHRC Publication, pp.248-259
5. Kovalenko, A., Zhdan, M., & Shapovalov, O. (2025). "Forensic Document Examination in Economic Crime Investigations", *Baltic Journal of Economic Studies*, Vol.11, No.3, pp178-184.
6. Harralson, H. H. (2012). "Forensic Document Examination of Electronically Captured Signatures" *Digital Evidence & Electronic. Signature L. Rev.*, Vol.9, PP.67-73
7. Gupta, V., Aniket, H., Shivangi, S., & Saini, K. (2025). "Forensic importance and Advancements in Microscopic Examination of Questioned Documents" *Forensic Science Review*, Vol.37, No.1, PP.51-65.
8. Vastrick, T. W. (2004). "Admissibility issues in Forensic Document Examination", *Journal of the American Society of Questioned Document Examiners*, Vol.7, No.1, pp.37-47
9. Moore, W. C. (1958). "Effective Utilization of Questioned Document Examiner", *Nebraska Law Review*, Vol.37, No.3, pp.552-580.
10. Adedayo, O. M., & Olivier, M. S. (2025). "Examination of Customized Questioned Digital Documents", *Journal of Forensic Sciences*, Vol.70, No.2, pp.550-565.

Learning Outcomes

Upon completion of the Course, the students will able to:

- Explain the fundamental concepts of forensic document examination.
- Analyse and authenticate questioned documents using advanced forensic techniques.
- Adhere to ethical standards in handling and presenting forensic evidence.
- Study the role of forensic testimony in legal proceedings.
- Practise the knowledge of emerging technologies to support examination of questioned documents.

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PAPER -VIII

FORENSIC HUMANITIES AND INTERNATIONAL HUMAN RIGHT POLICIES

(Discipline Specific Elective Paper)

Objective of the Course

The course "Forensic Humanities and International Human Right Policies" is intended to provide the learners with a comprehensive understanding of the relationship between forensic sciences, humanities, and international human rights standards in the administration of justice. It seeks to acquaint students with the ethical, legal, social, and humanitarian dimensions of forensic practices and the role of international human rights instruments in safeguarding human dignity, liberty, equality, and justice. The course aims to develop interdisciplinary knowledge regarding the application of forensic methods in the protection of human rights, investigation of human rights violations, humanitarian crises, custodial violence, genocide, war crimes, and crimes against humanity. It also intends to enhance students' understanding of international conventions, institutional mechanisms, and global policies relating to human rights protection and forensic investigations. Further, the course encourages critical thinking, research aptitude, and analytical skills in examining the intersection between science, law, ethics, and human rights while promoting accountability, professional ethics, and respect for constitutional and international legal safeguards. In addition, the course aims to inculcate a humanitarian and rights-based approach in forensic and criminal justice practices.

This course will help the students to:

- To introduce students to the fundamental concepts, principles, and scope of forensic humanities and international human rights policies.
- To develop an understanding of the relationship between forensic sciences, human rights protection, and humanitarian justice systems.
- To familiarize learners with international human rights instruments, conventions, treaties, and organizations involved in the protection of human rights.
- To enable students to appreciate the role of forensic science in the investigation of human rights violations, war crimes, genocide, torture, and custodial deaths.
- To provide knowledge regarding ethical standards, professional accountability, and legal safeguards in forensic and human rights investigations.

COURSE OUTLINE

Module I: Foundations of Forensic Humanities and Human Rights Discourse

a) Meaning, scope, and evolution of Forensic Humanities
b) Philosophical foundations of human dignity and rights
c) Historical development of international human rights norms
d) Universalism, cultural relativism, and contemporary human rights debates

Module II: International Human Rights Frameworks and Global Justice Institutions

a) United Nations Human Rights System and Treaty Mechanisms; ICRC and Forensics (Contributions of Dr Morris Tidball-Binz)
b) Universal Declaration of Human Rights (UDHR); Regional international conventions and international criminal legal frameworks
c) International Covenant on Civil and Political Rights (ICCPR), International Covenant on Economic, Social and Cultural Rights (ICESCR); international humanitarian rights conventions (Genocide Convention, Four Geneva Conventions and Additional Protocols, Torture Convention)
d) Role of international judicial mechanisms (International Court of Justice, International Criminal Court), tribunals, and monitoring bodies on responsibilities of states during investigation, detention, and prosecution

Module III: Forensic Practices, Technology, and Human Rights Protection

a) Human rights dimensions of forensic investigation
b) Ethical standards in medico-legal and forensic practices; DNA profiling, narco-analysis, brain mapping, polygraph tests, and privacy concerns
c) Custodial violence, torture, enforced disappearances, and forensic accountability
d) Scientific evidence and fair trial guarantees with international standards governing forensic procedures and criminal investigations

Module IV: Vulnerable Communities, Humanitarian Concerns, and Policy Responses

a) Rights of women, children, refugees, migrants, prisoners, and indigenous communities
b) Gender justice and victim-centered approaches in forensic processes; Human trafficking, sexual violence, and transnational crimes
c) Humanitarian law and protection during armed conflicts; Disaster victim identification and humanitarian forensic action
d) Role of NGOs and international organizations in human rights advocacy

Module V: Emerging Challenges in Forensic Humanities and Human Rights Governance

a) Artificial intelligence, cyber governance, and human rights implications
b) Bioethics, medical autonomy, and forensic healthcare governance
c) Policy formulation, human rights impact assessment, and forensic governance models
d) Research trends and future directions in forensic humanities and international human rights policies

Recommended Readings:

Books:

1. Bhuiyan, M. J. H., & Uddin Khan, B. (Eds.) (2019), "*Revisiting the Geneva Conventions: 1949-2019*" Leiden, The Netherlands: Brill Nijhoff, ISBN: 9789004375543

2. Ambos, Kai (2022), "*Rome Statute of the International Criminal Court: Article-by-Article Commentary*", München: C.H.BECK Recht - Wirtschaft - Steuern, ISBN: 9783406779268.
3. Steiner, H. J., Alston, P., & Goodman, R. (2008) "*International Human Rights in Context: Law, Politics, Morals: Text and Materials*", 3rd Ed,. Oxford University Press, ISBN: 978-0-19-927942-5
4. Iriye, Akira, Petra Goedde, and William I. Hitchcock, (Eds) (2012) "*The Human Rights Revolution: An International history*", Oxford University Press, ISBN: 978-0-19-927942-5
5. Crawford, E., & Pert, A. (2024) "*International Humanitarian Law*", 1st Ed., Cambridge University Press; ISBN: 978-1-009-32670-4
6. Zyberi, G. (2008) "*The humanitarian face of the International Court of Justice: its contribution to interpreting and developing international human rights and humanitarian law rules and principles*", Utrecht University.
7. Wettstein, F. (2009) *Multinational Corporations and Global Justice: Human Rights Obligations of a Quasi-Governmental Institution*. Stanford University Press, ISBN: 978-0-8047-6240-3
8. Parra, R. C., & Ubelaker, D. H. (Eds.). (2023) *Anthropology of Violent Death: Theoretical Foundations for Forensic Humanitarian Action*, John Wiley & Sons.
9. Rosenblatt, A. (2015) *Digging for the disappeared: Forensic science after atrocity*, Stanford University Press.
10. Shevchuk, V., Dunaev, O., Tyshchenko, O., Biletska, G., & Nehrebetskyi, V. (2025) "*Innovative Methods in the Identification of Deceased Persons during Armed Conflicts and Disasters*: *Criminalistic and Forensic Medical Issues*", International Annals of Criminology, pp.1-20.

Articles:

1. Moon, C. (2014) "Human rights, human remains: Forensic Humanitarianism and the Human Rights of the Dead", *International Social Science Journal*, Vol. 65, No:215-216, pp.49-63.
2. Akpoghome, Theresa U., and Chukwudumebi O. Joseph-Asoh (2025) "The Updated Commentary on the Third Geneva Convention: A New Tool for Generating Respect for International Humanitarian Law." *Beijing Law Review*, Vol. 13, No. 4, pp. 912-930.
3. Rosenblatt, A. (2010) "International Forensic Investigations and the Human Rights of the dead" *Human Rights Quarterly*, Vol.32, No:4, pp. 921-950.
4. Srivatsava, Aparna & Tomar, Shivani (2026), "Role of Forensic Science in Protecting Human Rights and Ensuring Justice", *e-journal of International Relations,* Vol. 16, No:2, pp.429-444
5. Stan, C. A. (2012) "Forensic Standardizations in torture and death in custody investigations", *Interventional Medicine and Applied Science*, Vol. 4, No.4, pp.210-216.
6. Poblet, Marta, and Jonathan Kolieb (2018) "Responding to Human Rights Abuses in the Digital Era: New Tools, Old Challenges." *Stanford Journal of International Law*, Vol. 54, No.2, pp. 259-284.

7. Donnelly, S. (2012) "Forensic Science in a Human Rights Framework" *Australian Journal of Forensic Sciences*, Vol. 44, No:1, pp. 93-103.
8. Kirschner, R. H., & Hannibal, K. E. (1994), "The Application of the Forensic Sciences to Human Rights Investigations", *Med. & L.*, Vol.13, pp. 451.
9. Ubelaker, D. H., Shamlou, A., & Kunkle, A. E. (2019) "Forensic Anthropology in the Global Investigation of Humanitarian and Human Rights Ubuse: Perspective from the published record", *Science & Justice*, Vol.59, No:2, pp.203-209.
10. Steadman, D. W., & Haglund, W. D. (2005) "The Scope of Anthropological Contributions to Human Rights Investigations", *Journal of Forensic Sciences*, Vol.50, No: 1

Learning Outcomes:

Upon successful completion of the course "Forensic Humanities and International Human Rights Policies", the students will be able to:

- Understand the fundamental concepts, principles, and interdisciplinary nature of forensic humanities and international human rights policies.
- Explain the relationship between forensic science, humanitarian studies, and the protection of human rights within the criminal justice system.
- Identify and interpret major international human rights instruments, conventions, treaties, and institutional mechanisms relating to global justice and human dignity.
- Analyse the role of forensic sciences in the investigation of human rights violations, custodial violence, torture, genocide, war crimes, and crimes against humanity.
- Examine the emerging challenges in protecting human rights through the lens of forensic science application both nationally and internationally

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PAPER -IX

CONTEMPORARY FORENSIC DIVISIONS

(Discipline Specific Elective Paper)

Objective of the Course:

This course is designed to introduce students to emerging and interdisciplinary branches of forensic science that play an increasingly significant role in contemporary investigation and justice administration. It seeks to develop a conceptual and practical understanding of specialized forensic domains such as forensic linguistics, forensic entomology, forensic fraud investigation, and space forensics, while highlighting their relevance in criminal detection, evidentiary analysis, and technological advancement. The course also seeks to prepare students to engage with contemporary forensic challenges arising from cyber-enabled frauds, digital communication, transnational financial crimes, and the increasing commercialization and militarization of outer space. Through theoretical and applied learning, students will gain the capacity to critically analyze forensic evidence and contribute effectively to the administration of justice and policy development in emerging forensic fields.

This course will help the students to:

- Comparatively analyses the transit stages of Traditional Forensic into Contemporary Forensic Mechanism
- Understand the implications of Forensic Linguistics in the current scenario in hate crimes, cyber defamations etc.,
- Evaluate the significance of forensic entomology in determining post-mortem intervals, crime scene reconstruction, and medico-legal investigations
- Observe the techniques and investigative methods used in detecting financial frauds, corporate misconduct, cyber-enabled economic offences, and white-collar crimes.
- Comprehend the concept and scope of space forensics, including satellite evidence, cyber threats to space infrastructure, and forensic challenges arising from outer space activities.

COURSE OUTLINE

Module I: Traditional Forensic Divisions v. Contemporary Forensic Divisions

a) Foundations of Traditional Forensic Divisions
b) Emerging Trends in Contemporary Forensic Divisions
c) Comparative Analysis of Traditional and Contemporary Forensic Practices
d) Forensic divisions in fair investigation and administration of justice

Module II: Forensic Linguistics

a) Introduction to Forensic Linguistics
b) Linguistic Evidence and Criminal Investigation
c) Digital Communication and Cyber Linguistics
d) Expert testimony and judicial appreciation of forensic linguistic reports

Module III: Forensic Entomology

a) Understanding Forensic Entomology
b) Insect Evidence and Death Investigation
c) Applications of Forensic Entomology in Criminal Justice
d) Scientific reliability and admissibility of entomological evidence before courts

Module IV: Forensic Fraudology

a) Overview to Forensic Fraudology
b) Techniques and Methods of Fraud Investigation
c) Cyber Fraud, Economic Offences, and Regulatory Framework
d) Preventive Dimensions of Fraudology

Module V: Space Forensic

a) Emergence of Space Forensics
b) Techniques and Applications of Space Forensics
c) Space Crimes, Satellite debris, Cyber Threats, and International Regulatory Framework
d) Future Dimensions of Space Forensics

Recommended Readings:

Books:

1. Rao, P.K., Tharmavaram, M. and Pandey, G., D. Rawtani and C.M. Hussain (Eds) (2020) *Conventional Technologies in Forensic Science*, *Technology*, In: Forensic Science: Sampling, Analysis, Data and Regulations, WILEY-VCH Publications, ISBN: 9783527347629
2. Burney Ian. Hamlin, Christopher (2019) *Global Forensic Cultures: Making Fact and Justice in the Modern Era*, John Hopkins University Press, ISBN: 9781421427508
3. Coulthard, M., Johnson, A., & Wright, D. (2016). *An Introduction to Forensic Linguistics: Language in Evidence*, 2nd Ed, Routledge Publications, ISBN 9781138641716
4. Olsson, J., & Luchjenbroers, J. (2013) *Forensic linguistics*, 3rd Ed, Blossom Berry Publications, ISBN 9781441186607
5. Amendt, J., Goff, M. L., Campobasso, C. P., & Grassberger, M. (Eds.). (2010). *Current Concepts in Forensic Entomology* (pp. 1-376). Dordrecht, Springer Netherlands, ISBN: 978-1-4020-9683-9
6. Emerible, Ebenezer Okechukwu et el, Hakan Bozdogan, Luke Chinaru Nwosu (Eds), (2023), *Forensic Entomology*, IKSAD Publications, ISBN: 978-625-367-368-0
7. Tomberlin, Keith Jeffery, Benbow M. Eric, (2015), *Forensic Entomology: International Dimensions and Frontiers*, CRC Press, Taylor & Francis Group, ISBN: ISBN 9780367575885
8. Manning, G. A. (2010), *Financial Investigation and Forensic Accounting*, 3rd Edition, Routledge Publications, ISBN: ISBN 9780367864347

9. Pasco, G. A. (2012), "*Criminal Financial Investigations: The Use of Forensic Accounting Techniques and Indirect Methods of Proof*", 2nd Ed., CRC Press. ISBN: 9781466562622
10. Marouf Hasion, JR (2016), "*Forensic Rhetorics and Satellite Survillance: Visualization of War Crimes and Human Rights Violations*" Lexington Publications, ISBN: 978-1-4985-3590-8

Articles

1. Tkachenko , Nataliia *et el,* (2024), "Comparative Analysis of Models of Organisation of Forensic Activities: International Experience", *Social and Legal Studios,* Vol. 9, No.1, pp. 56-64, ISSN 2617-4162
2. Zhang, M. (2022) "Forensic imaging: A Powerful Tool in Modern Forensic Investigation" *Forensic Sciences Research,* Vol.7; No:3, pp. 385–392.
3. Alduais, A., Al-Khulaidi, M. A., Allegretta, S., & Abdulkhalek, M. M. (2023). "Forensic linguistics: A Scientometric Review". *Cogent Arts & Humanities,* Vol.10, No:(1); pp. 1-42
4. R.T. Mani, *et el,* (2025) Corrigendum to "An Evolution of Forensic Linguistics: From Manual analysis to Machine learning – A narrative review", *Forensic Science International: Reports,* Vol.11
5. M. Benecke, (2001), "A Brief History of Forensic Entomology", *Forensic Science International,* Vol.120, No: 1&2, pp.2-14
6. E. P. Catts, M. L. Gof (1992), "Forensic Entomology in Criminal Investigations", *Annual Review of Entomology,* Vol.37, pp. 253-272
7. Akinbowale OE, Klingelhöfer HE, Zerihun MF (2020), "An innovative approach in combating economic crime using forensic accounting techniques". *Journal of Financial Crime,* Vol. 27, No. 4 pp. 1253–1271
8. Korzh, V. (2024), "Forensic Characterization of Economic Crimes Committed by Organized Groups with Corruption Relations", *Theory and Practice of Forensic Science and Criminalistics,* Vol.35, No:2, pp.44-57
9. D.L. Mains *et el* (2024), "Forensic Analysis of recent Debris-Generating Events", *Journal of Space Safety Engineering,*Vol.11, No:3, pp.388-394
10. Ruffell, Alastair (2010), "Forensic Pedology, Forensic Geology, Forensic Geoscience, Geoforensics and Soil Forensics", *Forensic Science International,* Vol. 202, Issues 1–3, pp. 9-12

Learning Outcomes

Upon successful completion of the course, students will be able to:

- Interpret the progressive development of Forensic Science investigation from the traditional method to the modern era
- Analyze linguistic evidence such as authorship identification, discourse analysis, threat communication, and forensic interpretation of written and spoken language in criminal investigations.
- Evaluate the role of forensic entomology in determining time since death, crime scene reconstruction, and medico-legal investigations through insect-based evidence.

- Examine the nature, methods, and investigative processes involved in financial frauds, white-collar crimes, cyber frauds, and corporate misconduct.
- Understand the emerging concept of space forensics and analyze legal, technological, and evidentiary issues relating to satellite systems, cyber-space activities, extraterrestrial investigations, and space-related crimes.

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PAPER -X

FORENSIC CRIMINOLOGY INCLUDING VICTIMOLOGY

(Generic Elective Paper)

Objectives of the Course:

This course is designed to provide students with a comprehensive understanding of the interrelationship between crime, criminal behaviour, victims, and the functioning of the criminal justice system. It aims to familiarize learners with the foundational theories of criminology, victimology, forensic psychology, and investigative sciences while encouraging critical engagement with contemporary issues in criminal justice administration. The course seeks to develop analytical and interdisciplinary perspectives on crime causation, deviant behaviour, victim rights, and forensic practices within both national and international contexts. It introduces students to modern forensic methods, behavioural analysis, investigative mechanisms, and clinical approaches relevant to crime prevention and justice delivery. The course also emphasizes the protection of victim rights, restorative justice mechanisms, and evolving trends in forensic criminology influenced by technological and socio-legal developments.

This Course will help the students to

- Explain the fundamental concepts, principles, and theoretical foundations of forensic criminology and victimology and evaluate their relevance in contemporary criminal justice systems
- Understand the significance of forensic investigation by estimating the criminal behaviour and deviant activities
- Distinguish Forensic Psychology and Clinical Psychology in the Criminal Justice Administration
- Interpret the role of victimology in shaping victim-centered justice, compensation mechanisms, restorative justice practices, and policy reforms
- Identify the emerging contemporary development in the field of forensic criminology and victimology

COURSE OUTLINE

Module I: Foundations of Forensic Criminology and Victimology

a) Outline to Forensic Criminology and Victimology
b) Schools and Theories of Crime Causation
c) Victimology: Concept and Dimensions
d) Forensic Criminology, Society, and Criminal Justice System

Module II: Criminal Behaviour, Deviance, and Forensic Investigation

a) Psychological and Sociological Dimensions of Criminal Behaviour
b) Typologies of Crime and Emerging Criminal Trends
c) Behavioural Forensics and Offender Profiling

d) Forensic Investigation and Scientific Crime Detection

Module III: Forensic Psychology and Clinical Psychology

a) Details of Forensic and Clinical Psychology
b) Criminal Behaviour, Mental Disorders, and Psychological Assessment
c) Clinical Psychology in Criminal Justice and Correctional Administration
d) Emerging trends in forensic and clinical psychology including cyber psychology, neuropsychology, and digital mental health interventions

Module IV: Victimology and Victim Rights in Criminal Justice

a) Understanding and theories of Victimology
b) Victim Rights and Protection Mechanisms
c) Victimisation in Contemporary Crimes
d) Victim Justice, Restorative Approaches, and Emerging Trends

Module V: Contemporary Developments in Forensic Criminology and Victimology

a) Emerging Trends in Forensic Criminology & Victimology
b) Behavioural Science and Technological Integration in Crime Investigation
c) Contemporary Victimology and Victim Support Systems
d) Contemporary reforms, international cooperation, and future directions in forensic criminology and victimology

Recommended Readings:

Books

1. Petherick, W., Turvey, B. E., & Ferguson, C. E. (Eds.). (2009) *Forensic Criminology*. Elsevier Academic Press, ISBN: 13: 978-0-12-3757071-6
2. Melissa K. A. Lukings *et el* (2026), "*Understanding Criminology and Victimology*", In: Understanding Cybercrime Victim Services: Challenges, Risks, Strategies and Trends, Springer Publications, pp. 1-40, ISBN: 978-3-032-13272-7
3. Cortes-Perez, O. I. (Ed.). (2025). *Ecologies of Violence: A Comparative Perspective in Contemporary Victimology and Criminology*, Springer Nature Publications, ISBN: 978-3-031-91956-5
4. Gopalan, R. T. (Ed.). (2022). *Victimology: A Comprehensive Approach to Forensic, Psychosocial and Legal Perspectives*, Springer Nature, ISBN: 978-3-031-12929-2
5. Curt R. Bartol *et el* (2012) "*Current Perspectives in Forensic Psychology and Behaviour*" 3rd Ed., Sage Publications, ISBN: 978-1-4129-9244-2
6. Wallace, L. (2026), "*Victimology within Forensic Psychology*", In: Fido, D., Zangeneh, M., Spenser, K. (eds) Core Foundations and Contemporary Issues in Forensic Psychology, pp. 285-316, Springer, ISBN: 978-3-032-03312-3
7. Michael O'Connell, Beulah Shekhar, Purvi Pokhariyal (Eds), (2024), "*Forensic Victimology: A Study in Criminal Victimisation,* Forensic Justice, 1st Ed., Routledge Publications, pp.1-22, ISBN: 978-1-032-62930-8

8. Brent E. Turvey (2023), "*Forensic Victimology: Examining Violent Crime Victims in Investigative and Legal Contexts*", 3rd Ed., Academia Press, ISBN: 978-0-12-821768
9. Gopalan, R.T. Rejani Thudalikunnil Gopalan(Eds) (2026) "*Victimology, Forensic Victimology, and the Criminal Justice System: Emerging Trends"*, In: Forensic Victimology Exploring Human Trafficking and Terrorism, Springer Publication, pp. 3-24, ISBN: 978-3-032-17552-6
10. Ji, G., Alkhayer, J. (2025). *Balancing Justice and Ethics: Legal and Ethical Paradigms in Forensic Victimology*. In: Gupta, C.M., Lambert, E. (eds) Fundamentals of Forensic Victimology, Springer, ISBN: 978-3-031-95987-5

Articles

1. Ferguson, C., & Turvey, B. E. (2009). *Victimology: A brief history with an introduction to forensic victimology*. Forensic victimology: Examining violent crime victims in investigative and legal contexts, Elsevier Publications, pp.1-32.
2. Quinney, Richard. (1965), "Is criminal behaviour deviant behaviour" *British Journal of Criminology*, Vol. 5, No:2, pp.132-142.
3. Chopin, J., Beauregard, E., Baroche, C., Piridjani, M., Sabot, M., & Fortin, F. (2022). "An exploration of unsolved missing persons cases suspected of a criminal outcome: A forensic victimology approach", *Journal of Investigative Psychology and Offender Profiling*, Vol. 19., No:3, pp.118–134.
4. Gudjonsson, G.H. (2003), "Psychology brings justice: the science of forensic psychology" *Criminal Behav. Ment. Health,* Vol.13, pp.159-167
5. Brougham, P. L., & Uttley, C. M. (2017), Risk for Researchers Studying Social Deviance or Criminal Behavior. *Social Sciences*, Vol. 6, No: 4), pp.130.
6. Rosanne H.D. de Roo *et el* (2022), "The Added Value of Behavioural Information in Crime Scene Investigations", *Forensic Science International: Synergy,* Vol.5
7. Okoru Alex Omojo, Aaron Anyanabia (2025), "Victimology, Crime Victimization and Victims of Crime (Rehabilitation And Support Programmes)", *FUOYE Journal of Criminology and Security Studies,* Vol. 4 No. 2, pp. 154-167
8. Petherick, W., Kannan, A., & Brooks, N. (2021), "Victim Precipitation: An Outdated Construct or an Important Forensic Consideration?" *Journal of Forensic Psychology Research and Practice,* Vol. 21, No:3, pp. 214–229
9. Grisso, T. (1993) "The differences between Forensic Psychiatry and Forensic Psychology" *Journal of the American Academy of Psychiatry and the Law* Online, Vol. 21, No:2, pp.133-145
10. Khan, C. (2023) "The Future of Criminology: Exploring Emerging Trends and Challenges", *Social Science Review Archives*, Vol. 1, No:1, pp.24-31.

Learning Outcomes

Upon successful completion of the course, students will be able to:

- Understand the basis of Forensic Criminology and Victimology
- Critically analyze criminal behaviour, deviance, and patterns of offending through sociological, psychological, and legal perspectives.

- Assess the significance of forensic psychology and clinical psychology in understanding offender behaviour, mental health issues, criminal profiling, and rehabilitation processes.
- Evaluate the rights, protections, and remedies available to victims within domestic and international criminal justice frameworks.
- Analyze emerging developments in forensic criminology and victimology, including cybercrime, digital forensics, technological advancements, and interdisciplinary investigative approaches.

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PAPER-XI

WILDLIFE AND ENVIRONMENTAL FORENSICS

(Generic Elective Paper)

Objectives of the Course:

The course "Wildlife and Environmental Forensics" is designed to provide students with a comprehensive understanding of the scientific, legal, and investigative dimensions of wildlife and environmental crimes. It aims to familiarize learners with the principles of forensic science applied to biodiversity protection, ecological conservation, and environmental governance. The course seeks to develop analytical and investigative skills necessary for identifying, collecting, preserving, and interpreting forensic evidence related to wildlife offences, pollution, habitat destruction, and ecological harm. It further intends to strengthen students understanding of national and international legal frameworks governing wildlife conservation and environmental protection while encouraging interdisciplinary research and policy-oriented learning. Through theoretical knowledge and practical exposure, the course aspires to prepare students to address emerging environmental challenges, support sustainable justice mechanisms, and contribute effectively to environmental accountability and conservation efforts.

This course will help the students to

- Understand the conceptual framework of Wildlife and Environmental crimes
- Acquaint with the basic principles and foundations of biodiversity with the application of forensic examinations
- Familiarize with the distinct application of Forensic examination of Environmental crime and offences against Wildlife agencies
- Explore the national and international legislatures and instruments relating to Environment and Wildlife Protection
- Disseminate the contemporary approaches of sustainable development with the aid of Forensic Science in consonance with legislative mechanism.

COURSE OUTLINE

Module I: Foundations of Wildlife and Environmental Forensics

a) Concept, scope, and evolution of wildlife and environmental forensics
b) Ecological crimes and environmental victimization
c) Principles of forensic ecology and environmental criminology
d) Role of forensic science in environmental governance and sustainability

Module II: Wildlife Crime Investigation and Species Identification

a) Illegal wildlife trade, poaching, and trafficking networks
b) Species identification through morphology and forensic biology
c) DNA profiling and molecular techniques in wildlife investigations

d) Wildlife crime scene management and evidence collection and Chain of custody and documentation in wildlife offences

Module III – Environmental Pollution and Forensic Examination

a) Air, water, soil, and noise pollution investigations
b) Forensic analysis of industrial and hazardous waste
c) Toxicological Examination of Environmental Contaminants, Environmental impact assessment and Forensic Auditing
d) Detection of ecological damage and restoration liabilities

Module IV – Forensic Technologies in Wildlife and Environmental Protection

a) GIS, remote sensing, and satellite applications in environmental monitoring
b) Digital tools and cyber intelligence in wildlife crime detection, Use of drones, Geospatial Mapping, and Surveillance Technologies
c) Laboratory methods for trace evidence and environmental sampling
d) Emerging technologies in environmental and conservation forensics

Module V – Legal Framework, Policy, and Contemporary Challenges

a) Wildlife protection and environmental laws in India
b) International Environmental Treaties and Conservation Protocols
c) Climate change, ecological security, and transnational environmental crimes
d) Contemporary trends, ethical concerns, and future directions in wildlife and environmental forensics

Recommended Readings:

Books:

1. Jane E. Huffman, John R. Wallace (2011), *Wildlife Forensics: Methods and Applications*, John Wiley & Sons Publications, ISBN 978-0-470-66258-8
2. Murphy, B. L., & Morrison, R. D. (Eds.). (2014) *Introduction to Environmental Forensics",* Academia Press, Elsevier Publications, ISBN: 978-0-12-404696-2
3. Cooper, J. E., & Cooper, M. E. (2013) *Wildlife Forensic Investigation: Principles and Practice*, CRC Press, Taylor & Francis Group, ISBN: 978-1-4398-1375-1
4. Petrisor, I. G. (2014) *Environmental Forensics Fundamentals: A Practical Guide*. CRC Press, Taylor & Francis Group, ISBN: 978-1-4665-7158-7
5. Linacre, A., & Tobe, S. (2013) *Wildlife DNA Analysis: Applications in Forensic Science*, John Wiley & Sons Publications, ISBN: 978-0-4706-6595-4
6. Ritz, K., Dawson, L., & Miller, D. (Eds.). (2008) *Criminal and Environmental Soil Forensics*, Springer Science & Business Media, ISBN: 978-1-4020-9203-9
7. Burnham-Curtis, M.K., Straughan, D.J., Hamlin, B.C., Draheim, H.M., Gray Partin, T.K., Wostenberg, D.J. (2021) *Wildlife Forensic Genetics and Biodiversity Conservation: The Intersection of Science, Species Management, and the Law*. In:

Underkoffler, S.C., Adams, H.R. (Eds) Wildlife Biodiversity Conservation. Springer Publications, pp. 163-191, ISBN: 978-3-030-64682-0
8. Kretser, H., Stokes, E., Wich, S., Foran, D., & Montefiore, A. (2017), *Technological Innovations Supporting Wildlife Crime Detection, Deterrence, and Enforcement*, In: Conservation criminology, pp. 155-177, ISBN:9781118935484
9. Dutta, J., Medhi, S., Gogoi, M., Borgohain, L., Maboud, N. G. A., & Muhameed, H. M. (2025) *Application of remote sensing and GIS in environmental monitoring and management,* In Remote Sensing and GIS Techniques in Hydrology (pp. 1-34). IGI Global Scientific Publishing, ISBN: 979-8-3693-9651-3
10. Morrison, R. D., & Murphy, B. L. (2010) *Environmental Forensics: Contaminant Specific Guide*, Academia Press, Elsevier Publications, ISBN: 978-0-12-507751-4.

Articles:

1. Jota Baptista, C., Seixas, F., Gonzalo-Orden, J. M., & Oliveira, P. A. (2022). "Wildlife Forensic Sciences: A Tool to Nature Conservation towards a One Health Approach", *Forensic Sciences*, Vol.2, No.(4), pp. 808-817
2. Ogden, R., & Linacre, A. (2015), "Wildlife Forensic Science: A Review of Genetic Geographic Origin Assignment" *Forensic Science International: Genetics*, Vol.18, pp. 152-159
3. Alacs, E.A., Georges, A., Fitz Simmons, N.N. *et al*, "DNA Detective: A Review of Molecular Approaches to Wildlife Forensics" *Forensic Science Medicine & Pathology* Vol.6, pp.180–194
4. Johnson, R. N., Wilson-Wilde, L., & Linacre, A. (2014) "Current and Future Directions of DNA in Wildlife Forensic Science" *Forensic Science International: Genetics*, Vol.10, pp. 1-11.
5. Ogden, R. (2010) "Forensic Science, Genetics and Wildlife Biology: Getting the Right mix for a Wildlife DNA Forensics Lab", *Forensic Science, Medicine, and Pathology*, Vol.6, No.3, pp. 172-179.
6. Bourret, V., Albert, V., April, J., Côté, G., & Morissette, O. (2020), "Past, Present and Future Contributions of Evolutionary Biology to Wildlife Forensics, Management and Conservation", *Evolutionary Applications*, Vol.13, No.6, pp. 1420-1434.
7. Nishant, K., Vrijesh, K. Y., & Ajay, K. R. (2017), "Wildlife Forensic: Current Techniques and Their Limitations" *Journal of Forensic Science and Criminology*, Vol.5, No.4.
8. Parra, L. (2022) "Remote Sensing and GIS in Environmental Monitoring", *Applied Sciences*, Vol.12, No.16, pp.1-8.
9. Bogatyrchuk, O. (2024) "Forensic Examinations during The Investigation of Criminal Offenses in the Field of Land Use, Subsoil Protection, and Atmospheric Air" *European Socio-Legal and Humanitarian Studies*, Issue No.1, pp.24-31.
10. Prof. Glenn Porter A, Spikmans V (2015) "Complexity of Scientific Evidence in Environmental Forensic Investigations", *Journal of Criminological Research, Policy and Practice*, Vol. 1 No. 4 pp. 223–232

Learning Outcomes

Upon successful completion of the course, students will be able to:

- Comprehend the fundamental concepts, scope, and significance of wildlife and environmental forensics in contemporary criminal justice and environmental governance.
- Analyze wildlife crimes, environmental offences, and ecological harms using scientific and forensic methods of investigation.
- Apply forensic techniques for species identification, environmental sampling, pollution analysis, and evidence interpretation.
- Evaluate the role of legal institutions, environmental policies, and international conventions in the prevention and control of wildlife and environmental crimes.
- Develop research, critical thinking, and problem-solving skills in addressing contemporary challenges relating to environmental protection, sustainability, and ecological justice.