M.Sc. Forensic Science

(W.E.F. Academic Session 2025-2026 onwards)

Syllabus

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		Curriculum Structure							
		Session 2025-2026 onwards							
		Name of the Program: M.Sc Forensic Science							
	Year: First						**Semester: I (Pawas)**		
	Course Code	Course Title	Contact Hrs per Week			Credits	Weightage (%)		
			L	T	P		CW$	MTE	ETE
Pawas Semester I	**Discipline Specific Core (DSC):**								
	25MFS9101T	Introduction to Forensic Science	4	0	0	4	10	20	70
	25MFS9102T	Forensic Chemistry and Toxicology	4	0	0	4	10	20	70
	25MFS9103T	Crime Scene Managment	4	0	0	4	10	20	70
	25MFS9101P	Forensic Practical- I	0	0	8	4	-	-	100
	Discipline Specific Elective (DSE): (Select any one)								
	25MFS9104T	Digital Forensics	4	0	0	4	10	20	70
	25MFS9105T	Molecular Biology	4	0	0	4	10	20	70
	Value Added Course (VAC):								
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	Seminar/Internship/Apprenticeship/Project/Community Outreach (S/I/A/P/C):								
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		Total				**22**			

Summary: I Semester (Pawas)		Credits
S.N.	Particulars	
1.	Discipline Specific Core (DSC):	16
2.	Discipline Specific Elective (DSE):	04
3.	Value Added Course (VAC):	02
4.	Seminar/Internship/Apprenticeship/Project/Community Outreach (S/I/A/P/C):	00
	Total	22
$CW (Class work): It would include attendance, class test/quiz test/assignments, ppt, play, learn by fun activities etc.		

Note: VAC to be selected from the list of VAC courses for PG, given on University website.

Curriculum Structure									
Session 2025-2026 onwards									
Name of the Program: M.Sc Forensic Science									
Year: First							**Semester: II (Vasant)**		
	Course Code	**Course Title**	**Contact Hrs per Week**			**Credits**	**Weightage (%)**		
			L	T	P		CW$	MTE	ETE
Vasant Semester II	**Discipline Specific Core (DSC):**								
	25MFS9201T	Forensic Biology and Serology	4	0	0	4	10	20	70
	25MFS9202T	Forensic Dermatoglyphics	4	0	0	4	10	20	70
	25MFS9203T	Questioned Document Examination	4	0	0	4	10	20	70
	25MFS9201P	Forensic Practical- II	0	0	8	4	-	-	100
	Discipline Specific Elective (DSE):								
	25MFS9204T	Forensic Psychology	4	0	0	4	10	20	70
	25MFS9205T	Advanced Forensic Chemistry	4	0	0	4	10	20	70
	Value Added Course (VAC):								
	----	----	--	--	--	2	--	--	--
	Seminar/Internship/Apprenticeship/Project/Community Outreach (S/I/A/P/C):								
	----	----	--	--	--	--	--	--	--
		Total				**22**			

Summary: II Semester (Vasant)		Credits
S.N.	**Particulars**	
1.	Discipline Specific Core (DSC):	16
2.	Discipline Specific Elective (DSE):	04
3.	Value Added Course (VAC):	02
4.	Seminar/Internship/Apprenticeship/Project/Community Outreach (S/I/A/P/C):	00
	Total	**22**
$CW (Class work): It would include attendance, class test/quiz test/assignments, ppt, play, learn by fun activities etc.		

Note: VAC to be selected from the list of VAC courses for PG, given on University website.

Curriculum Structure								
Session 2025-2026 onwards								
Name of the Programme: M.Sc Forensic Science								
Year: Second						**Semester: III (Pawas)**		

	Course Code	Course Title	Contact Hrs per Week			Credits	Weightage (%)		
			L	T	P		CW$	MTE	ETE
Pawas Semester III	**Discipline Specific Core (DSC):**								
	25MFS9301T	Research Methodology	4	0	0	4	10	20	70
	25MFS9301P	Laboratory Techniques in Forensic Science	0	0	8	4	--	--	100
	Discipline Specific Elective(DSE): Select Any Four								
	25MFS9302T	Data Science for Forensic Science	4	0	0	4	10	20	70
	25MFS9303T	Cyber Security Basics	4	0	0	4	10	20	70
	25MFS9304T	Blood Stain Pattern Analysis	4	0	0	4	10	20	70
	25MFS9305T	Ballistics and Explosives	4	0	0	4	10	20	70
	25MFS9306T	Forensic Medicine and Anthropology	4	0	0	4	10	20	70
	25MFS9307T	Emerging Trends in Forensic Science	4	0	0	4	10	20	70
	Value Added Course(VAC):								
	---	---	--	--	--	2	--	--	--
	Seminar/Internship/Apprenticeship/Project/Community Outreach (S/I/A/P/C):								
	---	---	--	--	--	--	--	--	--
		Total				**26**			

Summary: III Semester (Pawas)		Credits
S.N.	Particulars	
1.	Discipline Specific Core(DSC):	08
2.	Discipline Specific Elective (DSE):	16
3.	Value Added Course (VAC):	02
4.	Seminar/Internship/Apprenticeship/Project/Community Outreach (S/I/A/P/C):	00
	Total	26
$CW (Class work): It would include attendance, class test/quiz test/assignments, ppt, play, learn by fun activities etc.		

Note: VAC to be selected from the list of courses for PG, given on University website.

Curriculum Structure									
Session 2025-2026 onwards									
Name of the Programme: M.Sc Forensic Science									
Year: Second						Semester: IV (Vasant)			
	Course Code	Course Title	Contact Hrs per Week			Credits	Weightage (%)		
			L	T	P		CW$	MTE	ETE
Vasant Semester IV	**Discipline Specific Core (DSC):**								
	25MFS9401T	Forensic Intelligence and Analytics	4	0	0	4	10	20	70
	Discipline Specific Elective (DSE): Select Any Two								
	25MFS9402T	Advanced Cyber Forensic	4	0	0	4	10	20	70
	25MFS9403T	Forensic Entomology	4	0	0	4	10	20	70
	25MFS9404T	Wildlife Forensics	4	0	0	4	10	20	70
	25MFS9405T	Trace and Pattern Evidence	4	0	0	4	10	20	70
	Select Any One:								
	25MFS9401D	Dissertation	--	--	--	8	--	--	100
	25MFS9401V	Project	--	--	--	8	--	--	100
	25MFS9401S	Seminar	--	--	--	8	--	--	100
		Total				**20**			

Summary: IV Semester (Vasant)		Credits
S.N.	Particulars	
1.	Discipline Specific Core(DSC):	04
2.	Discipline Specific Elective (DSE):	08
3.	Value Added Course (VAC):	00
4.	Dissertation/ Seminar/ Project/ Internship (D/S/V/I):	08
	Total	**20**

Introduction to Forensic Science

Course Objectives:

To familiarize students with the fundamental concepts, scope, and applications of forensic science in criminal investigations.

Learning Outcomes:

1. Understand the basic principles and history of forensic science.
2. Comprehend the organizational structure of forensic laboratories.
3. Apply forensic methods to analyze crime scene evidence.
4. Demonstrate practical skills in crime scene management and evidence handling.
5. Evaluate the ethical and legal responsibilities of forensic experts.

Course Title:	Introduction to Forensic Science	Course Code: 25MFS9101T
Total Lecture hour 60		**Hours**
Unit I	**History and Development of Forensic Science and Organizational Structure and Branches of Forensic Science** Evolution and milestones in forensic science; Contributions of various scientists and landmark cases; Development of forensic science in India and international perspectives. Forensic science laboratories: National and International levels; Hierarchical structure and functioning; Different branches: forensic biology/serology/DNA fingerprinting, toxicology, ballistics, questioned documents, and digital forensics & digital forensics, forensic accounting, nursing.	15
Unit II	**Crime Scene Management and Evidence Collection** Crime scene protocols and contamination prevention; Evidence recognition, collection, preservation, and documentation; Chain of custody and its importance; Legal considerations in evidence handling and its admissibility in court.	15
Unit III	**Principles of Forensic Analysis** Techniques in fingerprint analysis, trace evidence, and biological fluids; Instrumental methods for chemical and biological analysis; Microscopic analysis, spectroscopy, and chromatography in forensic science.	15
Unit IV	**Ethical Issues and Legal Framework in Forensic Science** Professional ethics and responsibilities of forensic scientists; Chain of custody, expert testimony, and courtroom procedures; Role of forensic experts in legal investigations and human rights considerations	15
Suggestive Readings:		
1	Saferstein, R. (2018). Criminalistics: An Introduction to Forensic Science. Pearson.	
2	Sharma, B.R. (2019). Forensic Science in Criminal Investigation and Trials. Universal Law Publishing.	
3	James, S.H., & Nordby, J.J. (2017). Forensic Science: An Introduction to Scientific and Investigative Techniques. CRC Press.	

Forensic Chemistry and Toxicology

Course Objectives:

To provide students with a comprehensive understanding of the chemical analysis of forensic evidence and the detection of toxic substances in forensic investigations.

Learning Outcomes:

1. Understand the basic principles and history of forensic science.
2. Comprehend the organizational structure of forensic laboratories.
3. Apply forensic methods to analyze crime scene evidence.
4. Demonstrate practical skills in crime scene management and evidence handling.
5. Evaluate the ethical and legal responsibilities of forensic experts.

Course Title:	Forensic Chemistry and Toxicology	Course Code: 25MFS9102T
Total Lecture hour 60		**Hours**
Unit I	**Introduction to Forensic Chemistry** Basics of forensic chemistry and its role in crime investigation; Classification and analysis of chemical evidence: drugs, explosives, and environmental contaminants; Methods of collection, preservation, and documentation of chemical evidence.	15
Unit II	**Toxicology and Poisons** Definition, classification, and mechanism of action of poisons; Routes of exposure, toxicity levels, and lethal doses; Techniques for the detection and analysis of poisons in biological samples.	15
Unit III	**Alcohol and Drug Analysis** Chemical analysis of alcohol in blood and breath; Detection of narcotics, stimulants, hallucinogens, and prescription drugs; Forensic implications of drug abuse and overdose; Legal limits and interpretation of toxicological reports.	15
Unit IV	**Environmental and Industrial Toxicology or Analytical Techniques in Toxicology** Identification of environmental pollutants and industrial toxins; Analysis of heavy metals, pesticides, and chemical residues; Regulatory guidelines and environmental monitoring. Spectroscopic, chromatographic, and immunoassay techniques; Interpretation of toxicological findings in forensic investigations; Application of GC-MS, LC-MS, and AAS in toxicological analysis.	15
Suggestive Readings:		
1	Clark, E.G.C. (2011). Clark's Analysis of Drugs and Poisons. Pharmaceutical Press.	
2	Levine, B. (2019). Principles of Forensic Toxicology. Springer.	
3	Baselt, R. (2017). Disposition of Toxic Drugs and Chemicals in Man. Biomedical Publications.	
4	Casarett & Doull's (2019). Toxicology: The Basic Science of Poisons. McGraw-Hill Education.	

Crime Scene Management

Course Objectives:
To equip students with the knowledge and skills required to effectively manage crime scenes, ensuring proper collection, documentation, and preservation of evidence.

Learning Outcomes:
1. Understand the basic principles and history of forensic science.
2. Comprehend the organizational structure of forensic laboratories.
3. Apply forensic methods to analyze crime scene evidence.
4. Demonstrate practical skills in crime scene management and evidence handling.
5. Evaluate the ethical and legal responsibilities of forensic experts.

Course Title:	Crime Scene Management	Course Code: 25MFS9103T
Total Lecture hour 60		**Hours**
Unit I	**Introduction to Crime Scene Investigation and Documentation** Definition and types of crime scenes; Principles of crime scene management; Roles and responsibilities of the crime scene investigator; Understanding primary and secondary crime scenes. Photography, videography, and sketching of crime scenes; Note-taking and digital documentation methods; Importance of accurate documentation for court proceedings; Use of drones and 3D mapping for scene documentation.	15
Unit II	**Evidence Collection and Preservation** Techniques for collecting physical, biological, and trace evidence; Methods to prevent contamination and degradation of evidence; Packaging and labeling protocols; Evidence handling for different types of crime scenes (homicide, arson, cyber, etc.).	15

Unit III	**Chain of Custody and Legal Considerations** Understanding the chain of custody and its legal implications; Documentation and handling of evidence from the crime scene to the courtroom; Impact of mishandling evidence on legal outcomes; Role of expert testimony in validating evidence integrity.	15
Unit IV	**Forensic Mapping and Crime Scene Reconstruction** Techniques for mapping crime scenes using modern technology; Role of computer-aided design (CAD) in scene reconstruction; Analysis of blood spatter, bullet trajectories, and impact patterns; Virtual reconstruction and simulation techniques.	15

Suggestive Readings:	
1	Fisher, B. (2019). Techniques of Crime Scene Investigation. CRC Press.
2	Lee, H.C., & Pagliaro, E.M. (2013). Forensic Evidence and Crime Scene Investigation. Jones & Bartlett Learning.
3	Horsnell, J. (2016). The Practice of Crime Scene Investigation. CRC Press.
4	Gardner, R.M. (2018). Practical Crime Scene Processing and Investigation. CRC Press.

Forensic Practical – I

Course Objectives:

To develop practical skills and hands-on experience in standard laboratory techniques applied in forensic investigations

Learning Outcomes:

1. Understand the principles and applications of instrumental analysis in forensic science.
2. Identify the appropriate analytical methods for different types of forensic evidence.
3. Operate advanced analytical instruments for forensic examination.
4. Interpret instrumental data and integrate findings into forensic reports.
5. Apply instrumental methods to complex forensic investigations.

Course Title:	**Forensic Practical – I**	**Course Code: 25MFS9101P**
Total Lecture hour 45		**Hours**
	1. To demonstrate of organizational structure of forensic laboratories (National & International). 2. Mock crime scene exercise. 3. To review past criminal cases and elucidate which theory best explains the criminal behaviour of the accused. 4. To collect and preserve biological evidence. 5. To demonstrate crime scene photography techniques 6. To collect trace evidence. 7. Comparison of soil samples using microscopic and density-gradient distribution of particles method. 8. To carry out preliminary examination of glass, soil, fibre, paint and cloth evidences. 9. Preliminary identification of biological fluids. 10. To cite examples of crime cases in which the media acted as a pressure group. 11. Identification of commonly encountered inorganic poisons arsenic, antimony, bismuth, mercury by colour test and microscopic examination. 12. Identification of ethyl alcohol and methyl alcohol by colour tests and microscopic examination. 13. Identification and comparison of inks by TLC. 14. To design a questionnaire for the first responder to the death scene. 15. To design a checklist for the forensic scientists at the death scene.	

Digital Forensics

Course Objectives:
To impart knowledge and practical skills for identifying, collecting, analyzing, and presenting digital evidence in criminal investigations.

Learning Outcomes:
1. Understand the fundamentals of digital forensics and cybercrime.
2. Identify sources of digital evidence and perform forensic acquisition.
3. Analyze file systems, operating systems, and logs.
4. Utilize tools and techniques for forensic imaging and analysis.
5. Document findings and maintain evidentiary integrity in legal contexts.

Course Title:	Digital Forensics	Course Code: 25MFS9104T
Total Lecture hour 60		**Hours**
Unit I	**Introduction to Digital Forensics and Cybercrime** Scope and evolution of digital forensics; Types of cybercrimes: hacking, phishing, data breaches, cyber stalking; Legal and ethical issues in digital forensics.	15
Unit II	**Digital Evidence and Forensic Acquisition** Types of digital evidence: hard drives, USBs, mobile devices, cloud storage; Chain of custody and best practices in evidence collection; Forensic duplication and imaging techniques.	15
Unit III	**File Systems and Operating System Forensics** FAT, NTFS, and ext file systems; Windows registry, system logs, and restore points; User activities, artifacts, and metadata analysis.	15
Unit IV	**Tools and Techniques in Digital Forensics or Reporting and Legal Aspects** EnCase, FTK, Autopsy, and open-source forensic tools; Disk and memory analysis, keyword searching, and file carving; Mobile device forensics and SIM card analysis. Documentation and report writing; Presenting digital evidence in court; Role of digital forensic experts as witnesses.	15
Suggestive Readings:		
1	Nelson, B., Phillips, A., & Steuart, C. (2019). Guide to Computer Forensics and Investigations. Cengage Learning.	
2	Casey, E. (2011). Digital Evidence and Computer Crime. Academic Press.	
3	Kruse, W.G., & Heiser, J.G. (2002). Computer Forensics: Incident Response Essentials. Addison-Wesley.	
4	Sammes, T., & Jenkinson, B. (2007). Forensic Computing: A Practitioner's Guide. Springer.	

Molecular Biology

Course Objectives:
- To provide basic knowledge of molecular biology and its application in forensic science.
- To develop understanding of DNA analysis and identification for forensic investigations.

Learning Outcomes:
1. Understand basic concepts of DNA, genes, and molecular biology.
2. Learn techniques used for DNA profiling and analysis.
3. Identify and interpret DNA evidence in forensic cases.
4. Prepare reports and present DNA evidence in court.

Course Title:	Molecular Biology	Course Code: 25MFS9105T
Total Lecture hour 60		Hours
Unit I	**Introduction to Molecular Biology** Definition and scope of molecular biology in forensics, Structure and function of DNA and RNA, Genes and chromosomes: basic concepts, Role of molecular biology in personal identification and criminal investigations.	15
Unit II	**DNA Profiling Techniques** DNA extraction from biological samples, PCR and STR analysis, Mitochondrial DNA and RFLP basics, Quality control and handling of DNA samples.	15
Unit III	**Forensic Applications of Molecular Biology** Identification of individuals and kinship analysis, Analysis of degraded or mixed DNA samples, Use in disaster victim identification and crime scene investigations	15
Unit IV	**Reporting and Legal Considerations** Data documentation and report preparation, Presentation of DNA evidence in court, Ethical considerations and admissibility of DNA evidence.	15

Semester-II

Forensic Biology and Serology

Course Objectives:
To provide students with theoretical and practical understanding of biological evidence and serological techniques in forensic investigations

Learning Outcomes:
1. Understand the nature and significance of biological evidence.
2. Identify and analyze body fluids using serological methods.
3. Examine hair, fibers, and tissue samples for forensic identification.
4. Apply immunological and enzymatic tests for evidence analysis.
5. Interpret serological findings for forensic reporting

Course Title:	Forensic Biology and Serology	Course Code: 25MFS9201T
Total Lecture hour 60		Hours
Unit I	**Introduction to Forensic Biology or Blood and Bloodstain Analysis** Overview of forensic biology and its scope; Classification and characteristics of biological evidence; Collection, preservation, and documentation techniques. Physical and chemical characteristics of blood; Presumptive and confirmatory tests for blood detection; Interpretation of bloodstain patterns.	15
Unit II	**Seminal, Salivary, and Other Body Fluids** Identification of semen, saliva, urine, and vaginal secretions; Acid phosphatase, choline, and other biochemical tests; Forensic importance and limitations.	15
Unit III	**Hair, Fiber, and Tissue Examination** Microscopic characteristics and comparison of hair and fibers; Mitochondrial DNA in hair analysis; Examination of tissue samples for identification.	15
Unit IV	**Immunological and Enzymatic Techniques** Immunodiffusion, immunoelectrophoresis, and ELISA; Enzymatic markers for species identification; Recent advances in forensic serology.	15
Suggestive Readings:		
1	Eckert, W.G. (1997). Introduction to Forensic Sciences. CRC Press.	
2	Saferstein, R. (2018). Criminalistics: An Introduction to Forensic Science. Pearson.	

| 3 | Sharma, B.R. (2019). Forensic Science in Criminal Investigation and Trials. Universal Law Publishing. |
| 4 | Quinche, N. (2015). Forensic Biology. Elsevier |

Forensic Dermatoglyphics

Course Objectives:
- To provide comprehensive knowledge of dermatoglyphic patterns and their application in forensic science.
- To understand the role of fingerprint, palm, and sole patterns in personal identification, criminal investigations, and human genetics studies.

Learning Outcomes:
1. Understand the basic principles of dermatoglyphics and its development.
2. Identify and classify fingerprint, palm, and sole patterns.
3. Apply dermatoglyphic analysis for personal identification and criminal investigations.
4. Analyze dermatoglyphic data in population studies and genetic research.
5. Prepare reports and present findings in forensic contexts.
6. Apply instrumental methods to complex forensic investigations.

Course Title:	Forensic Dermatoglyphics	Course Code: 25MFS9202T
Total Lecture hour 60		**Hours**
Unit I	**Forensic Dermatoglyphics-I** History and development of Dermatoglyphics, formation of ridges, pattern types, pattern area. Classification of fingerprints- Henry's system of classification, single-digit classification, Composition of sweat, Development of chance, latent, visible and plastic prints.	15
Unit II	**Forensic Dermatoglyphics-II** Conventional methods of development of latent prints- fluorescent methods, magnetic powder method, fuming method, chemical method etc. Application of laser and other radiations to develop latent fingerprints, metal deposition method and development of latent prints on skin. Taking of fingerprints from living and dead person, preserving and lifting of fingerprints, class and individual characteristics, various types of ridge characteristics,	15
Unit III	**Biometrics** Biometric evidences such as finger impressions, retina, iris pattern, voice, gait pattern, face recognition, 3D face recognition, automatic forensic dental identification, Recent developments.	15
Unit IV	**Forensic Applications and Reporting** Role in criminal investigations, Automated Fingerprint Identification System (AFIS), photography of fingerprints, Report preparation, expert testimony, and ethical considerations	15

Questioned Document Examination

Course Objectives:

To provide comprehensive knowledge and practical skills related to the examination of questioned documents in forensic investigations

Learning Outcomes:

1. Understand the principles of document examination and handwriting analysis.
2. Identify forgery, alterations, and counterfeit documents.
3. Analyze inks, papers, and printing techniques.
4. Utilize instruments and techniques for document analysis.
5. Prepare expert reports and provide courtroom testimony

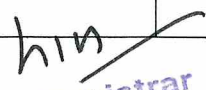| Course Title:	Questioned Document Examination	Course Code: 25MFS9203T
Total Lecture hour 60		**Hours**
Unit I	**Introduction to Questioned Documents or Handwriting and Signature Analysis** Definition and classification of questioned documents; Types of document frauds and their forensic significance; Legal standards and admissibility. Individual characteristics and principles of handwriting identification; Comparison of standard and disputed writings, Factors affecting handwriting and disguised writing.	15
Unit II	**Forgery and Alteration Detection** Types of forgeries: simulated, traced, and freehand; Erasures, additions, obliterations, and indented writings; Use of oblique lighting, infrared, and ultraviolet radiation	15
Unit III	**Ink, Paper, and Printing Examination** Analysis of ink and paper types using chromatography and spectrometry; Examination of printing processes: offset, inkjet, laser, and typewriting; Dating of documents and age determination techniques	15
Unit IV	**Document Examination Instruments and Report Writing** Instruments: Video Spectral Comparator (VSC), Electrostatic Detection Apparatus (ESDA); Preparation of forensic document examination reports; Role of expert witness and presentation in court.	15
Suggestive Readings:		
1	Ellen, D. (2006). Scientific Examination of Documents: Methods and Techniques. CRC Press.	
2	Hilton, O. (1993). Scientific Examination of Questioned Documents. CRC Press.	
3	Harrison, W.R. (2008). Suspect Documents: Their Scientific Examination. Universal Law Publishing.	
4	Kelly, J.S., & Lindblom, B.S. (2006). Scientific Examination of Questioned Documents. CRC Press	

Forensic Practical – II

Course Objectives:

To develop practical skills and hands-on experience in standard laboratory techniques applied in forensic investigations

Learning Outcomes:

1. Understand the principles and applications of instrumental analysis in forensic science.
2. Identify the appropriate analytical methods for different types of forensic evidence.
3. Operate advanced analytical instruments for forensic examination.
4. Interpret instrumental data and integrate findings into forensic reports.
5. Apply instrumental methods to complex forensic investigations.

Course Title:	Forensic Practical – II	Course Code: 25MFS9201P
Total Lecture hour 45		**Hours**
	1. To record plain and rolled fingerprints. 2. To carry out ten-digit classification of fingerprints. 3. To identify different fingerprint patterns. 4. To carry out ridge tracing and ridge counting.	

5. Develop latent fingerprints using different powder and chemical methods.
6. Lifting of fingerprints from different surfaces and analysis of the pattern details.
7. Blood spatter evidence analysis in the crime using forensic photography.
8. Microscopic examination of hair- differentiate human vs animal hair
9. Identification of blood stains using enzymatic and crystal tests.
10. Identification of seminal stains using presumptive test, crystal test and detection of spermatozoa.
11. Preliminary examination of documents, identification of natural variations and disguise
12. writings.
13. To carry out Examination of anonymous letters and disguised writing
14. To decipher secret writings and indentations.
15. Analysis of genuine vs forged signatures.

Forensic Psychology

Course Objectives:
To provide understanding of the relationship between psychology and law, to introduce psychological principles in criminal investigations, to develop knowledge of offender behavior, mental health assessment, and courtroom applications of psychology

Learning Outcomes:
Understand the fundamentals of forensic psychology, analyze psychological aspects of criminal behavior, apply psychological assessment techniques in investigations, interpret mental health reports for legal use, understand ethical and professional issues in forensic practice.

Course Title:	Forensic Psychology	Course Code: 25MFS9204T
Total Lecture hour 60		**Hours**
Unit I	**Introduction to Forensic Psychology :** Definition, scope, and historical development of forensic psychology, relationship between psychology and law, Ethical issues in forensic psychology, Insanity and Insanity Defense, Criminal profiling. Psychology in the courtroom, with special reference to Section 84 IPC, Psychology of evidence – eyewitness testimony, confession evidence.	15
Unit II	**Criminal Behavior and Personality** Classification of mental disorders, Theories of criminal behavior, psychological and sociological factors influencing crime, personality disorders and their forensic relevance. Juvenile delinquency- Definition, Types, Classification of Juvenile Delinquents; Factors in Juvenile Delinquency, Custody of juvenile delinquents.	15
Unit III	**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, Mc Naughten's Rule.	15
Unit IV	**Correctional Psychology** Institutional Corrections, Correctional facilities, Correctional Psychologists, Treatment And Rehabilitation in correctional facilities, Treatment of special populations: substance Abuse offenders, violent offenders, criminal psychopaths, sex offenders, women prisoners, Juvenile corrections	15

Advanced Forensic Chemistry

Course Objectives:
To provide in-depth knowledge of chemical principles and analytical techniques in forensic investigations, to develop skills for identification and analysis of drugs, toxins, explosives, and trace evidence, to prepare students for applying chemical evidence in criminal and civil cases.

Learning Outcomes:
Understand principles of advanced forensic chemistry, identify and characterize drugs, toxins, and chemical substances, apply instrumental techniques for qualitative and quantitative analysis, analyze trace evidence including fibers, paints, and explosives, prepare forensic chemistry reports and understand legal and ethical considerations

Course Title:	Advanced Forensic Chemistry	Course Code: 25MFS9205T
Total Lecture hour 60		Hours
Unit I	**Principles of Forensic Chemistry** Introduction to advanced forensic chemistry, chemical principles relevant to toxicology and drug analysis, role of chemical evidence in criminal investigations, responsibilities of forensic chemists in the justice system.	15
Unit II	**Drugs and Toxic Substances** Classification of drugs and poisons, detection and identification of narcotics, stimulants, depressants, hallucinogens, and toxins, preliminary screening methods, color tests and microcrystalline tests	15
Unit III	**Instrumental Methods in Forensic Chemistry** Chromatography techniques (TLC, HPLC, GC), spectroscopy methods (UV-Vis, IR, Mass), principles of modern analytical instrumentation, interpretation of chemical data in forensic investigations	15
Unit IV	**Trace Evidence, Explosives, and Reporting** Analysis of trace evidence (fibers, paints, glass), chemical analysis of explosives, interpretation and documentation of findings, preparation of forensic reports, ethical and legal considerations in chemical evidence presentation	15

Semester – III

Research Methodology

Course Objectives:
To acquire fundamental knowledge of Research Methodology and apply in sciences and applied sciences.

Learning Outcomes:
Understand principles of advanced forensic chemistry, identify and characterize drugs, toxins, and chemical substances, apply instrumental techniques for qualitative and quantitative analysis, analyze trace evidence including fibers, paints, and explosives, prepare forensic chemistry reports and understand legal and ethical considerations.

Course Title:	Research Methodology	Course Code: 25MFS9301T
Total Lecture hour 60		**Hours**
Unit I	**Introduction** Sampling and Data Collection: Motivation in Research, Types of Research, Research process, Review of Literature and its Importance, Methods to write review of literature, Research gap, Research Design, sampling Vs. Census, Steps in Sampling process, Types of sampling, Data collection techniques, Referencing styles, plagiarism, ethics in research.	15
Unit II	**Measurement and Scaling Techniques** Nominal Scale, Ordinal Scale, Interval Scale, Ratio Scale, Criteria for good measurement, Attitude measurement Scale –Likert's Scale, Semantic Differential Scale.	15
Unit III	**Statistical Tools for Data Analysis-I** Measures of central tendency - Mean, Median, Mode ,Quartiles, Deciles and Percentiles Measures of Dispersion: Standard Deviation -Variance - Coefficient of Variance, Skewness,	15
Unit IV	**Statistical Tools for Data Analysis-II** Correlation - Karl Pearson's coefficient of Correlation, Rank Correlation, Formulation of hypothesis-Testing of hypothesis, Type I and Type II Errors. Parametric tests: Z-test, t-test, F-test, Analysis of Variance; One-Way and Two- way classification. Non parametric tests - Chi-Square test.	15

Laboratory Techniques in Forensic Science

Course Objectives:
To develop practical skills and hands-on experience in standard laboratory techniques applied in forensic investigations

Learning Outcomes:
1. Understand the principles and applications of instrumental analysis in forensic science.
2. Identify the appropriate analytical methods for different types of forensic evidence.
3. Operate advanced analytical instruments for forensic examination.
4. Interpret instrumental data and integrate findings into forensic reports.
5. Apply instrumental methods to complex forensic investigations.

Course Title:	Laboratory Techniques in Forensic Science	Course Code: 25MFS9301P
Total Lecture hour 45		**Hours**
	1. To separate ink and dye components from questioned documents using TLC. 2. To conduct preliminary color tests for detection of narcotic drugs and poisons. 3. To demonstrate fingerprint development on porous and non-porous surfaces. 4. To detect fluorescent security features and hidden inks on banknotes and passports using UV light.	

5. To reveal alterations, obliterations, and erased entries on questioned documents using UV illumination and oblique light.
6. To demonstrate agarose gel electrophoresis for comparison of DNA samples and interpretation of banding patterns.
7. To demonstrate extraction and isolation of DNA from biological samples for forensic analysis.
8. Comparison of soil samples using microscopic and density-gradient distribution of particles method.
9. Microscopic examination of hair and fibres.
10. Examination of comparison of class and individual characteristics of fired bullets.
11. To demonstrate comparison of glass fragments using flotation and refractive index (RI) methods for forensic identification.
12. 'Quantitative Determination of Paracetamol in a Tablet using UV-Visible Spectrophotometer'.
13. Imaging and recovery of deleted files and folders from storage media.
14. Analysis of skid marks and tire tread impressions using photographic evidence and sketching
15. Imaging the data using FTK Imager.

Data Science for Forensics Science

Course Objectives:
To introduce students to data science concepts and analytical methods applied in forensic investigations, focusing on data handling, statistical reasoning, and predictive modeling.

Learning Outcomes:
1. Understand foundational concepts of data science relevant to forensic analysis.
2. Perform data preprocessing, visualization, and statistical exploration.
3. Apply machine learning algorithms for forensic decision-making.
4. Evaluate forensic datasets using classification, clustering, and pattern recognition.
5. Interpret and communicate data-driven findings for legal contexts.

Course Title:	Data Science for Forensics Science	Course Code: 25MFS9302T
Total Lecture hour 60		**Hours**
Unit I	Introduction to Data Science and Forensics Overview of data science and its forensic applications; Types of forensic data and data sources; Role of big data in crime analysis.	15
Unit II	**Data Management and Preprocessing** Data formats, acquisition, cleaning, and normalization; Handling missing values, outliers, and categorical variables; Tools: Excel, Python (pandas, numpy).	15
Unit III	**Exploratory Data Analysis and Visualization** Descriptive statistics, data distributions, and summary measures; Graphical representation using histograms, boxplots, heatmaps; Tools: Python (matplotlib, seaborn), R basics.	15
Unit IV	**Machine Learning in Forensic Science or Interpretation, Reporting, and Ethics** Supervised learning: classification (KNN, decision trees, random forest); Unsupervised learning: clustering (K-means, hierarchical); Application in fingerprint recognition, voice matching, and fraud detection. Evaluating model accuracy and limitations; Communicating findings with visualizations and reports; Ethical concerns in data-driven forensic practices	15
Suggestive Readings:		

1	Provost, F., & Fawcett, T. (2013). Data Science for Business. O'Reilly.
2	Hastie, T., Tibshirani, R., & Friedman, J. (2016). The Elements of Statistical Learning. Springer.
3	Brown, D. (2020). Data Mining for Forensics. CRC Press.
4	Grus, J. (2019). Data Science from Scratch. O'Reilly.

Cyber Security Basics

Course Objectives:

To introduce students to the fundamental concepts of cybersecurity, focusing on the protection of digital information, systems, and networks against threats and attacks

Learning Outcomes:

1. Understand core concepts and terminologies of cybersecurity.
2. Recognize types of cyber threats, attacks, and vulnerabilities.
3. Learn basic network security mechanisms and cryptographic techniques.
4. Identify best practices for securing personal and institutional digital assets.
5. Explore cybersecurity laws and ethical considerations.

Course Title:	Cyber Security Basics	Course Code: 25MFS9303T	
Total Lecture hour 60			**Hours**
Unit I	**Introduction to Cybersecurity or Cyber Threats and Vulnerabilities** Definition, need, and scope; Cybersecurity vs. information security; Threat landscape and attack surfaces. Malware: viruses, worms, ransomware, spyware; Phishing, social engineering, insider threats; System vulnerabilities and zero-day exploits.		15
Unit II	**Network Security Fundamentals** Basics of computer networks and protocols; Firewalls, intrusion detection/prevention systems (IDS/IPS); Secure network architecture and VPNs.		15
Unit III	**Cryptography and Data Protection** Symmetric and asymmetric encryption; Hash functions and digital signatures; Secure communication protocols (SSL/TLS).		15
Unit IV	**Cyber Laws, Policies, and Ethics** Indian IT Act 2000 and its amendments; Global cybersecurity policies and data protection laws (GDPR); Ethical hacking, cybersecurity governance, and compliance		15
Suggestive Readings:			
1	Stallings, W. (2019). Cryptography and Network Security. Pearson.		
2	Pfleeger, C.P., & Pfleeger, S.L. (2015). Security in Computing. Pearson.		
3	Kumar, V. (2018). Cyber Security. Wiley India.		
4	Andress, J. (2020). The Basics of Information Security. Syngress		

Bloodstain Pattern Analysis `

Course Objectives:

To equip students with comprehensive theoretical knowledge and practical skills in analyzing bloodstain patterns to reconstruct crime scenes and determine the events leading to bloodshed

Learning Outcomes:

1. Understand the physical properties of blood relevant to stain formation.
2. Classify and interpret different types of bloodstain patterns.
3. Reconstruct events at a crime scene based on blood evidence.
4. Conduct experiments to simulate bloodstain patterns.
5. Document and report bloodstain analysis findings for legal use

Course Title:	Bloodstain Pattern Analysis	Course Code: 25MFS9304T
Total Lecture hour 60		Hours
Unit I	**Introduction to Bloodstain Pattern Analysis** Historical background and scope; Applications in forensic investigations; Legal significance of bloodstain evidence.	15
Unit II	**Blood Properties and Stain Formation** Physical and chemical properties of blood; Factors affecting blood behavior: gravity, surface tension, viscosity; Mechanisms of stain creation.	15
Unit III	**Classification of Bloodstain Patterns** Passive, projected, and transfer stains; Impact spatter, arterial spray, cast-off, expirated stains; Differentiating between low, medium, and high velocity stains	15
Unit IV	**Scene Reconstruction and Trajectory Analysis Practical Applications and Reporting** Area of origin and convergence calculations; Stringing method and computer-based reconstruction; Documentation, sketching, and photography of patterns Simulated crime scene analysis; Preparation of comprehensive bloodstain analysis reports; Expert testimony and court presentation.	15
Suggestive Readings:		
1	Bevel, T., & Gardner, R.M. (2008). Bloodstain Pattern Analysis: With an Introduction to Crime Scene Reconstruction. CRC Press.	
2	James, S.H., Kish, P.E., & Sutton, T.P. (2005). Principles of Bloodstain Pattern Analysis: Theory and Practice. CRC Press.	
3	Wonder, A.V. (2001). Bloodstain Pattern Evidence: Objective Approaches and Case Applications. Academic Press.	
4	Hueske, E.E. (2006). Practical Analysis and Reconstruction of Shooting Incidents. CRC Press	

Ballistics and Explosives

Course Objectives:

To provide detailed knowledge and practical exposure in the fields of forensic ballistics and explosives, emphasizing firearm identification, ammunition analysis, and post-blast investigation.

Learning Outcomes:

1. Understand the classification and mechanics of firearms and ammunition.
2. Analyze fired bullets, cartridge cases, and gunshot residues.
3. Examine explosive materials and devices used in criminal activities.
4. Conduct post-blast scene investigation and evidence collection.
5. Interpret ballistic and explosive findings for legal proceedings.

Course Title:	Ballistics and Explosives	Course Code: 25MFS9305T
Total Lecture hour 60		Hours
Unit I	**Firearms and Ammunition Basics** Classification of firearms: rifled and smooth bore; Ammunition components and types; Firearm mechanisms and internal ballistics.	15
Unit II	**Terminal and External Ballistics** Behavior of projectiles inside and outside the barrel; Wound ballistics and projectile impact analysis; Factors influencing trajectory and accuracy.	15
Unit III	**Forensic Ballistics and Evidence Examination** Identification of firearms from bullets and cartridge cases; Toolmarks, striations, and comparison microscopy; Gunshot residue (GSR) detection and interpretation	15
Unit IV	**Explosives and Detonations or Post-Blast Investigation and Legal Aspects**	15

	Classification of explosives: low vs. high explosives; Common military, commercial, and homemade explosives (IEDs); Explosion effects and blast wave characteristics. Crime scene management after explosions; Collection and analysis of explosive residues; Legal documentation and expert testimony.	

Suggestive Readings:

1	Heard, B.J. (2011). Handbook of Firearms and Ballistics. Wiley.
2	Vincent J.M. DiMaio (1999). Gunshot Wounds: Practical Aspects of Firearms, Ballistics, and Forensic Techniques. CRC Press.
3	Sharma, B.R. (2019). Forensic Science in Criminal Investigation and Trials. Universal Law Publishing.
4	Jauhari, R.K. (2017). Explosives and Bomb Disposal. Alpha Science.

Forensic Medicine and Anthropology

Course Title:	Forensic Medicine and Anthropology	Course Code: 25MFS9306T
Total Lecture hour 60		**Hours**
Unit I	**Medico legal aspects of death** Death: Signs of death and changes after death. Somatic death, molecular death, early changes after death - Algor mortis, rigor mortis, cadaveric spasm, heat stiffening, cold stiffening, Late changes – putrefaction-external and internal changes. Adiopocere, mummification. Asphyxia, drowning, hanging and strangulation. Causes and mechanism of traumatic death, manner of death	15
Unit II	**Injuries** Mechanical Injuries: Abrasions, Bruises, Lacerations, Incised wounds, Stab wounds, Firearm injuries, Defence injuries, fabricated injuries. Thermal injuries: Burn and scalds, Lightning, Electricity, Explosions. Ante - mortem and post-mortem, artificial injuries and aging of injuries	15
Unit III	**Personal Identification** Genesis and development of forensic anthropology. Personal identification of living persons: Somatoscopy – observation of hair on head, forehead, eyes, root of nose, nasal bridge, nasal tip, chin, Darwin's tubercle, ear lobes, supra-orbital ridges, physiognomic ear breadth, circumference of head. Scar marks and occupational marks. Somatometry – measurements of head, face, nose, cheek, ear, hand and foot, body weight, height. Indices - cephalic index, nasal index, cranial index, upper facial index. Genetic and congenital anomalies – causes, types, identification and their forensic significance	15
Unit IV	**Facial Reconstruction** Portrait Parle/ Bertillon system. Facial superimposition techniques. Use of somatoscopic and craniometric methods in reconstruction	15

Emerging Trends in Forensic Science

Course Objectives:
To provide students with insights into the latest developments and future directions in forensic science, integrating technology, interdisciplinary applications, and innovative methodologies

Learning Outcomes:
1. Understand the principles and applications of instrumental analysis in forensic science.
2. Identify the appropriate analytical methods for different types of forensic evidence.
3. Operate advanced analytical instruments for forensic examination.
4. Interpret instrumental data and integrate findings into forensic reports.
5. Apply instrumental methods to complex forensic investigations.

Course Title:	Emerging Trends in Forensic Science	Course Code: 25MFS9307T
Total Lecture hour 60		**Hours**
Unit I	**Technological Advancements in Forensics and Molecular** Role of AI, ML, and big data in forensic investigations; 3D printing and crime scene reconstruction; Smart surveillance and biometric innovations.Rapid DNA technologies and portable genetic testing.	15
Unit II	**Digital Transformation and Virtual Forensics or Nano-Forensics** Augmented and virtual reality in crime scene analysis; Virtual autopsy and digital evidence simulation; Blockchain for forensic data integrity. Nanotechnology in trace and explosive detection; Biosensors and lab-on-a-chip devices.	15
Unit III	**Forensics and Environmental Sustainability** Green forensics and eco-friendly analytical methods; Forensic applications in environmental and wildlife crime; Sustainable lab practices and ethical considerations.	15
Unit IV	**Global Trends and Future Outlook** International collaborations and standardization; Emerging areas: cyberbiosecurity, neuroforensics, forensic genomics; Forecasting challenges and innovation adoption in forensic science.	15
Suggestive Readings:		
1	Houck, M.M. (2022). Forensic Science: Modern Methods and Future Trends. Elsevier.	
2	Morgan, R.M. (2019). The Future of Forensic Science. Wiley.	
3	Jayaprakash, P.T. (2021). Recent Advances in Forensic Science. Springer.	
4	Christoforou, E., et al. (2018). Nanotechnology in Forensic Science. Wiley.	

Semester-IV

Forensic Intelligence and Analytics

Course Objectives:
To introduce students to the principles and practices of forensic intelligence and analytics, integrating data science with investigative techniques to support crime detection and prevention

Learning Outcomes:
1. Understand the fundamentals of forensic intelligence and analytical workflows.
2. Collect, manage, and analyze large datasets for crime pattern recognition.
3. Apply analytical tools to real-time and retrospective forensic investigations.
4. Generate intelligence reports to support law enforcement decision-making.
5. Evaluate ethical, legal, and policy issues in intelligence-led investigations.

Course Title:	Forensic Intelligence and Analytics	Course Code: 25MFS9401T
Total Lecture hour 45		**Hours**
Unit I	**Introduction to Forensic Intelligence** Evolution and scope of forensic intelligence; Intelligence cycle: direction, collection, processing, analysis, dissemination; Strategic vs. tactical intelligence	13
Unit II	**Data Sources and Crime Analytics** Sources: forensic case files, social media, mobile data, surveillance feeds; Crime pattern recognition and hotspot analysis; Link analysis and geospatial mapping	11
Unit III	**Analytical Tools and Techniques** Statistical tools, predictive modeling, and risk assessment; Use of software: IBM i2 Analyst's Notebook, ArcGIS, Tableau; Visual analytics and dashboard creation.	11
Unit IV	**Applications in Criminal Investigations, Ethics, Law, and Intelligence Sharing** Behavioral profiling, fraud analytics, organized crime analysis; Real-time crime center operations; Integration with forensic lab findings. Legal frameworks and data protection laws; Privacy, surveillance, and ethical use of intelligence; Interagency collaboration and information exchange protocols.	10
Suggestive Readings:		
1	Ratcliffe, J.H. (2016). *Intelligence-Led Policing.* Routledge.	
2	Chainey, S., & Ratcliffe, J. (2005). *GIS and Crime Mapping.* Wiley.	
3	Heuer, R.J. (1999). *Psychology of Intelligence Analysis.* CIA.	
4	Taniguchi, T., & Fritsch, E.J. (2017). *Crime Analysis with Crime Mapping.* Sage Publications	

Advanced Cyber Forensics

Course Objectives:
To provide students with specialized knowledge and advanced technical skills in cyber forensic methodologies, including digital evidence handling, advanced tools, and investigative procedures for cybercrimes.

Learning Outcomes:
1. Understand the scope and evolution of cyber forensics.
2. Analyze digital devices and networks for advanced forensic evidence.
3. Apply specialized tools for deep data recovery, decryption, and network analysis.
4. Handle complex cases of cybercrime such as hacking, malware, and financial fraud.
5. Document digital evidence with legal admissibility and maintain chain of custody.

Course Title:	Advanced Cyber Forensics	Course Code: 25MFS9402T
Total Lecture hour 60		**Hours**
Unit I	**Foundations and Frameworks in Cyber Forensics Digital Evidence and File System Forensics** Cybercrime classification and digital forensic lifecycle; Legal frameworks and global standards (IT Act, GDPR, ISO); Roles and responsibilities of a cyber forensic analyst. File systems: FAT, NTFS, ext series, HFS; File carving, metadata analysis, hidden files; Hashing algorithms and integrity validation.	15
Unit II	**Network Forensics and Intrusion Analysis** Network logs, packet capturing, and analysis using Wireshark; Email forensics, DNS tracking, and MAC spoofing detection; Detection of DDoS attacks, sniffing, spoofing, and firewall analysis.	15
Unit III	**Malware and Mobile Device Forensics** Malware classification, reverse engineering basics; Analysis of Android/iOS systems, app activity logging; SIM, SD card, and cloud backup analysis	15
Unit IV	**Encryption, Cloud, and Blockchain Forensics** Encryption and decryption methods; Cloud forensics methodologies and vendor platforms; Blockchain and cryptocurrency transaction analysis.	15
Suggestive Readings:		
1	Nelson, B., Phillips, A., & Steuart, C. (2019). Guide to Computer Forensics and Investigations. Cengage Learning.	
2	Casey, E. (2020). Digital Evidence and Computer Crime. Academic Press.	
3	Marcella, A.J., & Menendez, D. (2012). Cyber Forensics: A Field Manual for Collecting, Examining, and Preserving Evidence of Computer Crimes. Wiley.	
4	Agarwal, A., & Gupta, M. (2017). Systematic Digital Forensic Investigation. Springer.	

Forensic Entomology

Course Objectives:

To provide students with knowledge and practical skills in the use of insect evidence for forensic investigations, particularly in determining time since death and circumstances surrounding death

Learning Outcomes:

1. Understand the role and scope of forensic entomology in medico-legal investigations.
2. Identify common forensic insects and their succession patterns.
3. Estimate postmortem interval (PMI) using entomological evidence.
4. Collect, preserve, and analyze insect evidence from crime scenes.
5. Prepare forensic entomology reports for legal purposes.

Course Title:	Forensic Entomology	Course Code: 25MFS9403T
Total Lecture hour 60		**Hours**
Unit I	**Introduction to Forensic Entomology** Definition, history, and scope; Branches of forensic entomology: urban, stored-product, medico-legal; Applications in death investigations.	15
Unit II	**Biology and Identification of Forensically Important Insects and Insect Succession and Decomposition** Orders of importance: Diptera (blowflies), Coleoptera (beetles), etc.; Life cycles, development rates, and ecological roles; Morphological identification of insect species. Stages of decomposition and insect colonization; Factors affecting insect activity and development; Succession patterns in different environments.	15

Unit III	**Collection, Preservation, and Analysis of Insect Evidence** Techniques for insect collection at crime scenes; Preservation methods and rearing protocols; Laboratory analysis and documentation.	15
Unit IV	**Postmortem Interval Estimation and Case Applications** Calculating PMI using insect evidence; Case studies in forensic entomology; Report writing and legal admissibility.	15

Suggestive Readings:

1	Byrd, J.H., & Castner, J.L. (2019). Forensic Entomology: The Utility of Arthropods in Legal Investigations. CRC Press.
2	Gennard, D.E. (2012). Forensic Entomology: An Introduction. Wiley.
3	Catts, E.P., & Haskell, N.H. (1990). Entomology and Death: A Procedural Guide. Joyce's Print Shop.
4	Amendt, J., et al. (2010). Current Concepts in Forensic Entomology. Springer.

Wildlife Forensics

Course Objectives:

To introduce the scientific principles and techniques applied in wildlife forensics for the investigation of crimes involving flora and fauna, focusing on species identification, evidence analysis, and legal frameworks

Learning Outcomes:

1. Understand the scope and importance of wildlife forensics in biodiversity conservation.
2. Identify wildlife crime scenes and interpret physical and biological evidence.
3. Apply morphological and molecular techniques for species identification.
4. Recognize laws and conventions related to wildlife protection.
5. Prepare forensic reports and contribute to legal proceedings on wildlife offenses.

Course Title:	Wildlife Forensics	Course Code: 25MFS9404T
Total Lecture hour 60		**Hours**
Unit I	**Introduction to Wildlife Forensics** Definition, scope, and relevance to conservation; Common types of wildlife crimes: poaching, trafficking, illegal trade; National and international organizations involved.	15
Unit II	**Evidence Handling and Wildlife Crime Scene Investigation** Procedures for securing and processing wildlife crime scenes; Collection and preservation of biological and trace evidence; Role of veterinarians and wildlife experts	15
Unit III	**Species Identification Techniques** Morphological identification of feathers, hair, bones, and scales; Molecular methods: DNA barcoding and species-specific markers; Case studies in species identification.	15
Unit IV	**Wildlife Protection Laws and Conventions, Reporting and Expert Testimony** Indian Wildlife Protection Act, 1972; CITES (Convention on International Trade in Endangered Species); Role of wildlife crime control bureaus and legal enforcement. Structure and preparation of wildlife forensic reports; Courtroom presentation and expert witness roles; Challenges in prosecuting wildlife crimes	15

Suggestive Readings:

1	Singh, L.A.K. (2013). Wildlife Forensics and Crime Investigation. Daya Publishing.
2	Huffman, J.E., & Wallace, J.R. (2016). Wildlife Forensics: Methods and Applications. Wiley-Blackwell.
3	Cooper, J.E., & Cooper, M.E. (2007). Introduction to Veterinary and Comparative Forensic Medicine. Wiley.
4	Ogden, R. (2010). Forensic Science, Genetics and Biodiversity Conservation. Biodiversity and Conservation Journal.

Trace and Pattern Evidence

Course Title:	Trace and Pattern Evidence	Course Code: 25MFS9405T
Total Lecture hour 60		**Hours**
Unit I	**Impression Evidence and Paint** Types of Impression evidence, Significance of impression evidence, Tyre mark comparison. Skid marks, serial number restoration. Paint composition, macroscopic and microscopic studies, pigment distribution, micro-chemical analysis, solubility test, pyrolysis chromatographic techniques, IR spectroscopy and X-ray diffraction, interpretation of paint evidence.	15
Unit II	**Glass and Soil** Glass: Types of glass and their composition, Forensic examination of glass fractures, Determination of direction of impact, cone fracture, rib marks, hackle marks, physical matching, refractive index, and interpretation of glass evidence. Soil: Formation and types of soil composition of soil, particle size distribution, microscopic examination, density gradient analysis, interpretation of soil evidence, Discussion on important case studies related to soil evidence.	15
Unit III	**Fibre and Hair** Types of fibre, forensic aspects of fibre examination- fluorescence, optical properties, refractive index, birefringence, dye analysis. Physical fit and chemical testing. TLC, IR-micro spectroscopy, Py-GCMS. Difference between natural and man- made fibres. Collection and preservation of hair samples. Morphological examination of human and animal hair, determination of origin, race, sex, site from hair. Comparison between human and non-human hair. Macroscopic and microscopic features of hair.	15
Unit IV	**Tool Marks Evidence** Compression marks, striated marks, combination of compression and striated marks, Class characteristics and Individual characteristics, tracing and lifting of marks, Photographic examination of tool marks. Method of making-cast, punch, engrave, methods of obliteration and restoration.	15

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