

Kurukshetra University, Kurukshetra

(Established by the State Legislature Act-XII of 1956)

(A⁺⁺ Grade, NAAC Accredited)



Syllabus of Examination for Post Graduate Programme M.Sc. FORENSIC SCIENCE

**as per NEP 2020
Curriculum and Credit Framework for Postgraduate Programme**

**With CBCS-LOCF
With effect from the session 2025-26**

**DEPARTMENT OF ZOOLOGY
FACULTY OF LIFE SCIENCES**

KURUKSHETRA UNIVERSITY, KURUKSHETRA -136119

HARYANA, INDIA

Session: 2025-26			
Part A – Introduction			
Name of Programme	M.Sc. Forensic Science		
Semester	3		
Name of the Course	Forensic Ballistics and Explosives		
Course Code	M24-FSC-301		
Course Type	CC-9		
Level of the course	500-599		
Pre-requisite for the course (if any)	Science Subjects at UG Level		
Course Learning Outcomes (CLO)	CLO1. To introduce the classification and characteristics of firearms involved in various crimes. CLO2. To understand the methods of identification of firearms and ammunition. CLO3. To understand the ballistics phenomena used in the reconstruction of shooting incidents. CLO4: To learn about forensic analysis of evidence related to shooting case. CLO5. Students will get to know the types, chemistry, and examination of evidence related to explosive substances.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		
Part B-Contents of the Course			
Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.			
Unit	Topics		Contact Hours
I	History and Background of Forensic ballistics: classification and characteristics of firearms, components of firearms, firearm safety, bore and calibre, working and types of firing mechanism, smooth bore and rifled bore firearms, methods to produce rifling, purpose of rifling. Handguns, shot guns. Non-standard firearms: Improvised, Country made, Imitative firearms, identification of origin. Ammunition: Classification and composition of cartridges, propellants, cartridge case, wads, compositional aspects of various types of bullets and shotgun projectiles. Firearms Database, Cartridge & bullet Database		15
II	Forensic Ballistics: Definition types and background, Internal ballistics: General principle, such as size, shape and ignition of propellants, barrel length, pressure curve, recoil, Vibration & Jump, Barrel Fouling. External ballistics, factors affecting external ballistics, measurements of trajectory parameters, ballistic coefficient, air resistance, rifling and bullet stability, ricochet phenomenon. Terminal/wound Ballistics: Factors affecting wound ballistics, bullet penetration phenomena, energy concept, stopping power, temporary and		15

	permanent cavity, characteristics of rifled firearm injury, and smooth bore firearm injury. Forensic evaluation of firearms injury. Entry and exit wound, range, striking angle.	
III	Firearms and Ammunition Linkage: Principles, comparison of fired cartridge cases and bullets, Stereo and comparison microscopy, automated bullet-cartridge identification systems – BDAS,IBIS and NIBIN. Gunshot residues: Introduction, mechanism of GSR production, composition and their forensic evaluation, chemical and instrumental methods of GSR analysis. Shooter identification. Reconstruction of Shooting Incidence: Theory of shooting reconstruction, mathematics of shooting reconstruction, accidental discharge, determination of range and time of fire. Shot pattern testing, laboratory examination of firearms. Law related to examination of firearms in Indian arms act. Prohibited & non-prohibited Firearms.	15
IV	Explosives: Classification, types, Deflagration and Detonation, firearms database, composition and characteristics of low explosives, primary and secondary high explosives. Black powder, NC, NG, TNT, RDX, PETN, HMX, Dynamite, ANFO, Flexible Sheet Explosives, etc. Detonators, blasting cap, boosters, blasting accessories, explosive trains, IEDs and pyrotechniques, explosion process and effects, effects of blast waves on structures and humans. Specific approach to scene of explosion, reconstruction of sequence of events, post-blast residues, collection, analysis of explosion residues.	15
Total Contact Hours		60
Suggested Evaluation Methods		
Internal Assessment: 30		End Term Examination: 70
➤ Theory	30	➤ Theory: 70
•Class Participation:	5	Written Examination
•Seminar/presentation/assignment/quiz/class test etc.:	10	
•Mid-Term Exam:	15	
Part C-Learning Resources		
Recommended Books/e-resources/LMS:		
1. B. R. Sharma: Firearms in criminal investigation and trials. Universal Law Publishing; Fourth edition, 2012.		
2. J. Schwoeble and David L. Exline: Current methods in Forensic gunshot residue analysis CRC Press, 2000.		
3. Karl G. Sellier et al; Wound Ballistics and The Scientific Background, Elsevier Pub. Co.London, 1994.		
4. Yinon Jitrin. Modern Methods & Application in Analysis of Explosives, John Wiley & Sons, England, 1993.		
5. Explosive analysis manual, Directorate of Forensic Science, MHA, Govt. of India		
6. Hueske E. E., Practical Analysis and Reconstruction of Shooting Incidents, 2006, CRC Press.		
7. Vincent J. M., Di Maio, Gunshot woundsPractical Aspects of Firearms, Ballistics, and Forensic Techniques Second Edit. 1999, CRC Press		

Session: 2025-26			
Part A – Introduction			
Name of Programme	M.Sc. Forensic Science		
Semester	3		
Name of the Course	Computer Forensics and Recent Advances		
Course Code	M24-FSC-302		
CourseType	CC-10		
Level of the course	500-599		
Pre-requisite for the course (if any)	Science Subjects at UG Level		
Course Learning Outcomes (CLO)	CLO1: The student will be able to identify hardware and types of software tools used for committing crime and other related evidence. CLO2: Students will be aware of methods used for revealing the information needed in cybercrime cases, such as the recovery of deleted, encrypted, or damaged files. CLO3: Students will be able to understand the requirements for good practices and quality management of the Forensic Science Laboratory. CLO4: The distribution and security of intellectual property enlighten the students about the legal guidelines on access and distribution of information.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		
Part B-Contents of the Course			
Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.			
Unit	Topics		Contact Hours
I	Computer Crime: Basics of computers, hardware accessories, operating systems (window, Mac, Linux), Computer languages, Knowledge of LAN, MAN, WAN and Fiber optics, IP address, VOIP, File formats, Memory and its types. Methods of data storage, hash function -calculation and its importance, Meta data and its relevance in Forensics, server architecture, artificial intelligence. Computer crimes: Types of computer crime, unauthorized access, program manipulation, software piracy. Cyber Crime: Definition and classification of cybercrimes. Hacking, virus, obscenity and pornography, encryption and decryption methods, Investigation of cybercrime: Search and seizure of computer system, computer-based evidences. Data recovery, Forensic analysis of electronic data, Tools for analysis, Report writing.		15
II	Fundamental of Computer Security: Risk assessment and mitigation developing secure system, security models, damage control, assessment and auditing, and network security.		15

	Recent advances in Computer Forensics: Computer simulation, stenography and cryptography, Forensic linguistics, e- documents, digital signature.IT act 2000 - Introduction to offences and penalties related to cybercrime	
III	Video/Image Forensics -Imaging Softwares, steps of image Processing, Image Enhancement and restoration. Video processing and enhancement, Video authentication, Metadata analysis, hash value generation. Collection, handling and preservation of video files, Introduction to CCTV Forensics. The investigation of erased tapes, analysis of signals (Analog video image Processing), Compression, encryption methods. Cell phone/ Mobile Forensic – Seizing and preserving mobile devices, drones, Robots etc. Methods of acquisition of evidence from mobile devices	15
IV	Quality Management (ISO/IEC-17025, NABL): Introduction, general requirement for competence of testing, standardization and calibration of forensic laboratories—test and calibration methods and their validation, measurements, standards and reference materials, traceability, sampling, proficiency testing and review program, and management and technical requirements for quality assurance. Forensic nanotechnology, forensic sensing. Intellectual property rights: copyright, patents, and trademarks.	15
Total Contact Hours		60
Suggested Evaluation Methods		
Internal Assessment: 30		End Term Examination: 70
➤ Theory	30	➤ Theory: 70
• Class Participation:	5	Written Examination
• Seminar/presentation/assignment/quiz/class test etc.:	10	
• Mid-Term Exam:	15	
Part C-Learning Resources		
Recommended Books/e-resources/LMS:		
1. Tewari, R.K., et al.: Computer Crime & Computer Forensics selects Publisher, New Delhi, 2003.		
2. Vacca John R: Computer Forensics, Computer Crime Scene Investigation, Firewall Medial, An imprint of Laxmi Pub.		
3. Casey Eoghan: Handbook of Computer Crime Investigation, Forensic Tools & Technology, Academic Press.		
4. Darren R. Hayes, Practical Guide to Computer Forensics Investigations, A (Pearson IT Cybersecurity Curriculum (ITCC)) 1st Edition.		
5. William Oettinger, Learn Computer Forensics: A beginner's guide to searching, analysing, and securing digital evidence 1st Edition.		
6. Investigating Windows Systems 1st Edition by Harlan Carvey.		
7. Wolper, V. E. Photograph Restoration and Enhancement: Using Adobe Photoshop CC 2021 Version (3rd ed.).		
8. Forensic Speaker Identification by Phil Rose & James R. Robertson		
9. The Acoustic Analysis of Speech by Ray D Kent & Charles Read		

Session: 2025-26			
Part A – Introduction			
Name of Programme	M.Sc. Forensic Science		
Semester	3		
Name of the Course	Forensic Medicine		
Course Code	M24-FSC-303		
Course Type	DEC-1		
Level of the course	500-599		
Pre-requisite for the course (if any)	Science Subjects at UG Level		
Course Learning Outcomes (CLO)	CLO1: Students will be able to understand the cause of death and medico-legal aspects of death in various crimes. CLO2: Student will be able to understand about establish time since death, and post-mortem examination. CLO3: To understand various sexual offenses and the law related to sexual offenses, and methods of personal identification in crime cases. CLO4: Students will be able to observe and make inferences in order to initiate inquiries into criminal matters and medico-legal problems.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		
Part B-Contents of the Course			
Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.			
Unit	Topics		Contact Hours
I	Forensic Medicine: Objectives of medico legal investigation, Inquest and types of Inquest, Thanatology, Cause of death; types of death, Signs of death, mode and manner of death, Aphyxial death- Introduction, characteristics and types of asphyxia death. Mechanical asphyxia-Hanging, strangulation, suffocation, traumatic and drowning, medico legal importance of diatoms, starvation: Characteristics and legal aspects. Evidence related to axphysial death.		15
II	Thermal Death: Characteristics, type, rule of nine, antemortem and post-mortem burn, scald and burn and their medico-legal aspects. Lightning – Electrocutation. Estimation of time since death: Somatic, cellular and brain-death, Suspended animation. Immediate changes- cooling of body, lividity, rigor mortis, cadaveric spasm, cold stiffening and heat stiffening. Late change-putrefaction, adipocere, decomposition, skeletonization. Post-mortem examination, Exhumation		15
III	Injuries: Classification, types and characteristics of mechanical injuries, age of injury, antemortem and post mortem injury, artificial injury, grievous injury, suicidal/accidental/homicidal injuries; Regional Injuries and traffic injuries; self-inflicted injuries and examination. causes of death by mechanical, law related to injury and their medicolegal aspects.		15
IV	Crimes against women- Introduction to sexual offences: rape Investigation,		15

unnatural sexual offences, its medicolegal importance, Domestic violence and abuses at work place against women child abuses and abuses of old people, Abortion & Infant Deaths.Amendments in law related to sexual offences. sections of BNS related to sexual offences, Database of Sexual offenders. Identification of living and dead person: Living persons- Identification through race and religion, sex, age, stature, complexion and features. External marks- mole, birthmarks, occupation marks, scars, tattoo marks and deformities; Portrait parley/ Bertillon system, superimposition techniques- photographic and video superimposition.			
Total Contact Hours			60
Suggested Evaluation Methods			
Internal Assessment: 30		End Term Examination: 70	
➤ Theory	30	➤ Theory:	70
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		
Part C-Learning Resources			
Recommended Books/e-resources/LMS:			
1. J. P. Modi: Textbook of Medical jurisprudence &Toxicology, M.M. Tripathi Pub.			
2. K. Parikh: Parikh’s test book of medical jurisprudence Forensic medicine and toxicology			
3. K.S. Narayan Reddy, The Essentials of Forensic Medicine & Toxicology 34 th Edition.			
4. Anil Aggrawal Forensic Medicine and Toxicology.			
5. Simpson’s Forensic Medicine 14 th Edition, Taylor & Francis.			
6. V.V. Pillay: Text book of Forensic medicine and toxicology			

Session: 2025-26			
Part A – Introduction			
Name of Programme	M.Sc. Forensic Science		
Semester	3		
Name of the Course	Forensic Anthropology and Biometrics		
Course Code	M24-FSC-304		
CourseType	DEC-2		
Level of the course	500-599		
Pre-requisite for the course (if any)	Science Subjects at UG Level		
Course Learning Outcomes (CLO)	CLO1: To help prospective students learn about the basics of anthropology. CLO2: Learners will be capable to characterize human bones and animal bones. CLO3: Student will be able to understand techniques for recovering skeletonized human remains and their laboratory analysis CLO4: Student will be able to understand the procedure of bone examination to identify the age, sex and stature. CLO5: To help prospective students learn about the basics of disaster victim identification.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		
Part B-Contents of the Course			
Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.			
Unit	Topics	Contact Hours	
I	Forensic Anthropology: Development of Forensic Anthropology, scope and problems, development and structure of bones, microscopic analysis of bone, morphological study of human skeleton, comparative study of human and animal skeleton. Techniques for recovering skeletonised human remains. Osteometry, Craniometry: Introduction, methods and their importance in personal identification, Statistics	15	
II	Personal identification from skeleton remains: Determination of race from skull and other bones, determination of age, determination of gender, and reconstruction of stature from skeleton remains. Assessing Trauma and Time Since Death.	15	
III	Forensic Odontology: Definition, scope, structural variation and types of teeth. Determination of age and sex from teeth, Gustafson's method, dental anomalies and their significance Bite Marks: Methods of collection, preservation, recording, comparison and their significance. Facial Reconstruction: Introduction, theory and methods, importance of tissue depth to reconstruct various facial features, genital and congenital anomalies. Facial Restoration to identify the victims and human bombs in blast cases.	15	
IV	Biometrics: Scopes, types, biometric characteristics, biometric techniques- data collection, transmission, signal processing, storage, identification. Fingerprint,	15	

	face, Iris and retina imaging, ear, speech recognition, pattern comparison, termination of human gait pattern in living people, Thermogram. Application of biometric tool.		
Total Contact Hours			60
Suggested Evaluation Methods			
Internal Assessment: 30		End Term Examination: 70	
➤ Theory	30	➤ Theory:	70
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		
Part C-Learning Resources			
Recommended Books/e-resources/LMS:			
1. Linda L. Klepinger: Fundamentals of Forensic Anthropology, Wiley-LISS.			
2. Bradley J. Adam: Forensic Anthropology. Infobase Publishing			
3. B.C. Smith, et al.: DNA & Forensic Odontology- Manual of Forensic Odontology, Colorado Springs, USA, 1995.			
4. L.C. Jain: Intelligent Biometric Techniques in Fingerprint and face recognition, CRC Press Ohio, 1999.			
5. S. Hillison: Dental Anthropology, Cambridge Univ. Press, UK 1996.			
6. Taylor: Forensic Art and Illustration, CRC Press. 2000			
7. James Wayman, Anil Jain, Davide Maltoni Dario Maio. Biometric Systems Technology, Design and Performance Evaluation. Springer			

Session: 2025-26				
Part A– Introduction				
Name of the Programme		M.Sc. Forensic Science		
Semester		3		
Name of the Course		Practical based on Papers M24-FSC-301 to M24-FSC-302		
Course Code		M24-FSC-305		
Course Type		PC-5		
Level of the course		500-599		
Pre-requisite for the course (if any)		Science Subjects at UG Level		
Course Learning Outcomes (CLO)	CLO1: The students will gain practical knowledge of the identification of firearms and ammunition involved in various crimes. CLO2: The student will be able to conduct forensic analysis of evidence related to shooting incidents, such as bullets, cartridges, barrels, CLO3: The student will be able to analyze explosive substances. CLO4: Students will be able to identify and track suspicious criminal activities going through email or computer-related devices.			
Credits		Theory	Practical	Total
		0	4	4
Teaching Hours per week		0	8	8
Internal Assessment Marks		0	30	30
End Term Exam Marks		0	70	70
Max. Marks		0	100	100
Examination Time		0	4 hours	
Part B-Contents of the Course				
Practicals				Contact Hours
Practical Contents	1. Examination and comparison of fired bullets 2. Examination of characteristics of firearms—calibre, choke, etc. 3. Examination and Comparison of Fired Cartridges/Cases. 4. Determining the number of shots based on their size and weight. 5. To perform chemical tests for powder residues and barrel wash. 6. To determine range of firing. 7. Examination of Firearms Injuries 8. Identification of explosives by chemical colour test. 9. Identification of explosives by TLC methods 10. Image processing using tools like Photoshop, Photo Paint, etc. 11. To study about types of IP addresses. 12. Phishing case report 13. Creation & verification of Digital Signature 14. Virus attack case report			120
Suggested Evaluation Methods				
Internal Assessment: 30			End Term Examination: 70	
➤ Practicum	30	➤ Practicum	70	
• Class Participation:	5	Lab record, Viva-Voce, write-up and execution of the practical		
• Seminar/Demonstration/Viva-voce/Lab records etc.:	10			
• Mid-Term Exam:	15			
Part C -Learning Resources				
Recommended Books/e-resources/LMS:				

1. Working Manual, Forensic ballistic. Directorate of Forensic Science MHA, Government of India.
2. Wolper, V. E. (2020). Photograph Restoration and Enhancement: Using Adobe Photoshop CC 2021 Version (3rd ed.). Mercury Learning & Information
3. M. Johari, Identification of Firearms, Ammunition and Firearms Injuries; BPR&D, New Delhi

Session: 2025-26				
Part A– Introduction				
Name of the Programme		M.Sc. Forensic Science		
Semester		3		
Name of the Course		Practical based on Papers M24-FSC-303 to M24-FSC-304		
Course Code		M24-FSC-306		
Course Type		PC-6		
Level of the course		500-599		
Pre-requisite for the course (if any)		Science Subjects at UG Level		
Course Learning Outcomes (CLO)	CLO1: The students will be capable of identifying human bones and animal bones. CLO2: The student will be able to understand the analysis methods for bone for recovering skeletonized human remains. CLO3: Students will be skilled in bone examination to identify the age, sex, and stature of a person. CLO4: Student will gain practical skill in anthropometric measurement of humans for personal identification.			
Credits		Theory	Practical	Total
		0	4	4
Teaching Hours per week		0	8	8
Internal Assessment Marks		0	30	30
End Term Exam Marks		0	70	70
Max. Marks		0	100	100
Examination Time		0	4 hours	
Part B-Contents of the Course				
Practicals				Contact Hours
Practical Contents	1. Morphological identification of Human and animal bones 2. Estimation of stature from long bones 3. To perform craniometric measurements on skull. 4. Lifting identification and comparison of bite marks. 5. Determination of age from skull sutures. 6. Determination of sex from skull. 7. Determination of sex from Pelvis. 8. To Perform osteometric measurements on long bones. 9. To Perform craniometric measurements on skull. 10. To perform somatometric measurement on living. (a) Height vertex,			

Internal Assessment: 30		End Term Examination: 70	
➤ Practicum	30	➤ Practicum	70
• Class Participation:	5	Lab record, Viva-Voce, write-up and execution of the practical	
• Seminar/Demonstration/Viva-voce/Lab records etc.:	10		
• Mid-Term Exam:	15		
Part C-Learning Resources			
Recommended Books/e-resources/LMS:			
1.	Working Manual of Directorate of Forensic Science Services MHA, Government of India.	Forensic	Biology,
2.	Jurisprudence and Toxicology	Modi JS:	Medical
3.	contain details of each experiment.	Online	manuals

Session: 2025-26				
Part A – Introduction				
Name of Programme		M.Sc. Forensic Science		
Semester		3		
Name of the Course		Basics of Forensic Science		
Course Code		M24-OEC-353		
Course Type		OEC		
Level of the course		500-599		
Pre-requisite for the course (if any)		Science Subjects at UG Level		
Course Learning Out comes (CLO)	CLO1: Learn about the concept of forensics, principles of forensic science, and handling of evidence at a crime scene. CLO2: Student will be able to understand the scientific methods of interrogations CLO3: The students will be aware of the evidence related to forensic biology. CLO4: To learn about the basics of fingerprints, their characterization, and comparison methods.			
Credits		Theory	Practical	Total
		2	0	2
Teaching Hours per week		2	0	2
Internal Assessment Marks		15	0	15
End Term Exam Marks		35	0	35
Max. Marks		50	0	50
Examination Time		3 hours		
Part B-Contents of the Course				
Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unitand the compulsory question. All questions will carry equal marks.				
Unit	Topics			Contact Hours
I	Forensic Science: Definition and concept of forensic science, scope of forensic science, basic principles of forensic science. Physical evidence introduction, types, classification and forensic significance. Forensic Science Laboratory. Handling of crime scene: definition, types of crime scene, protection and recording of crime scene, search for physical clues, collection and preservation of physical clues, and chain of custody.			7.5
II	Personal Identification: Introduction and Analysis of Blood, Semen, Saliva, Hair, DNA Fingerprinting, Facial Superimposition, and Bite Mark Analysis.			7.5
III	Methods of Interrogation: introduction, Principle, lie detection methods, polygraph, Narco Analysis, and Brain Fingerprinting.			7.5
IV	Fingerprints: Introduction, classification of Fingerprints pattern, characteristics, development methods of Latent Finger Prints, Comparison of Finger Prints.			7.5
Total Contact Hours				30
Suggested Evaluation Methods				
Internal Assessment: 15			End Term Examination: 35	
➤ Theory	15		➤ Theory:	35
• Class Participation:	5		Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10			

• Mid-Term Exam:	15	
Part C-Learning Resources		
Recommended Books/e-resources/LMS: 1. Sharma B.R. Forensic Science in Criminal Investigation and Trials, Universal Law Publishing Company. 2. BS Nabar: Forensic Science in Crime Investigation 3. Gaensselen R., Harris H. and Lee H. (2007), Introduction to Forensic Science and Criminalistics, McGraw-Hill Education.		

Session: 2025-26			
Part A – Introduction			
Name of Programme	M.Sc. Forensic Science		
Semester	4		
Name of the Course	Forensic Physics		
Course Code	M24-FSC-401		
Course Type	CC-11		
Level of the course	500-599		
Pre-requisite for the course (if any)	Science Subjects at UG Level		
Course Learning Out comes (CLO)	CLO1: Students will be able to conduct forensic analysis of various pieces of evidence related to hit-and-run cases. CLO2: The student will be able to understand detailed forensic analysis of glass, paint, fiber, and other clues of forensic significance. CLO3: To identify types and composition of building materials and to elucidate the use of tool marks in their restorations CLO4: Student will be able to understand the basics of voice production and comparison methods of voice evidence.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		
Part B-Contents of the Course			
Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.			
Unit	Topics		Contact Hours
I	Forensic Physics: Introduction and scope, tools and techniques of forensic physics, examination of vehicle in case of road traffic accident, reconstruction and proactive measures, skid mark evaluation, collision investigation and reconstruction. Glass: Types of glass and their composition—soda-lime, borosilicate, safety glass, laminated, light-sensitive, tempered/toughened, wire glass, and coloured glass. Matching and comparison. Forensic examinations of glass fractures—rib marks, hackle marks, cone fractures, wavy backward fragmentation, and concentric and radial fractures. Colour, fluorescence, physical measurements, refractive index, density gradient, Becke line, specific gravity examination, and elemental analysis of glass evidence.		15
II	Paint: Types of paint and their composition, macroscopic and microscopic analysis of paint pigments, pigment distribution, microchemical analysis (solubility test, pyrolysis gas chromatography, TLC, colorimetric analysis, IR spectroscopy, and X-ray diffraction), elemental analysis, mass spectrometer, and interpretation of paint evidence. Fiber: Types of fibers, forensic aspects of fiber examination—fluorescence, optical properties, refractive index, birefringence, and dye analysis. Physical fit and chemical testing. TLC, IR-micro spectroscopy, Py-MS. Difference between natural and man-made fibers. Miscellaneous Evidence: Wire, broken bangles, seals, counterfeit coins,		15

	ropes/strings, their introduction & forensic examination.	
III	Building Materials: Cement—Composition, Types, Forensic Analysis: bromoform test, fineness test, ignition-loss test, and identification of adulterated cement. Mortar and concrete analysis. Soil: Types and composition of soil, sample preparation, removal of contaminants, colour, molecular particle size distribution, turbidity test, pH measurements, microscopic examination, density gradient analysis, ignition-loss test, elemental analysis, and interpretation of soil evidence. Tool Marks: Theory, types of tool marks, forensic examination, and restoration methods of obliterated tool marks. Methods of lifting tool marks.	15
IV	Voice Analysis and Tape Authentication: Introduction to voice identification and its forensic importance Anatomy of the vocal tract, Voice production theory, uniqueness in a person’s voice, Resonance and overtones, vocal formants, interspeaker and intraspeaker variations, Discriminating tests: closed test, open test, collection of standards for comparison. Speaker profiling: segregation of speech samples, auditory analysis/listener’s approach, spectrographic approach or voiceprint analysis, and automatic speaker recognition technique.	15
Total Contact Hours		60
Suggested Evaluation Methods		
Internal Assessment: 30		End Term Examination: 70
➤ Theory	30	➤ Theory: 70
• Class Participation:	5	Written Examination
• Seminar/presentation/assignment/quiz/class test etc.:	10	
• Mid-Term Exam:	15	
Part C-Learning Resources		
Recommended Books/e-resources/LMS:		
1. B.R. Sharma, Forensic Science in Criminal Investigation and Trials, Universal Law Publishing; Fourth edition, 2013.		
2. David A. Crown, The Forensic Examination of Paints and Pigments, Toylor & amp; Francis, NY, 2001.		
3. N. Gilbert: Criminal Investigation; Third edition, Macmillan Publishing Company.		
4. Noon: Forensic Engineering Investigation, 2000.		
5. Saferstein: Forensic Science Handbook, Vol. I, II & III, Prentice Hall Inc. USA.		
6. Richard Saferstein. Criminalistics: An Introduction to Forensic Science. 10th edit. Prentice-Hall, New Jersey.		
7. Forensic Speaker Identification by Phil Rose & James Robertson		
8. Forensic Voice Identification by Harry Hollien		

Session: 2025-26			
Part A – Introduction			
Name of Programme	M.Sc. Forensic Science		
Semester	4		
Name of the Course	Forensic Dactylography and other impressions		
Course Code	M24-FSC-402		
Course Type	CC-12		
Level of the course	500-599		
Pre-requisite for the course (if any)	Science Subjects at UG Level		
Course Learning Out comes (CLO)	CLO1: The student will understand the history of dactylography and various classification methods of fingerprints. CLO2: The students will learn the conventional and recent techniques of latent fingerprint development. CLO3: The student will be acquainted with the comparison, identification, and retrieval of fingerprint data. CLO4: The students will be able to handle and retrieve information from available foot/tire impression evidence from different surfaces.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		
Part B-Contents of the Course			
Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.			
Unit	Topics		Contact Hours
I	History and development of finger prints: Development of dermal ridges in intra-uterine life. Finger, palm and sole prints, palmer lines and creases. morphology of ridged skin, types, and variations in finger prints: Causes and genetics, population variations. Finger Prints Bureau. Sample collection: Basics of taking inked prints, collection of prints, samples of living and dead, devices and material for recording prints. Classification of finger Prints, pattern types, pattern area. Classification systems: Henry system of classification (Primary to tertiary and key classification) extension of Henry system searching of finger prints, , single finger print.		15
II	Chance Finger Prints: Latent prints, plastic prints, causes, composition of sweat. Development of latent finger prints on porous and non-porous surfaces. Powder methods: such as fluorescent powder, magnetic powder. Fuming methods: Iodine and cyanoacrylate methods. Chemical methods: Ninhydrin and its analogue silver nitrate, physical developer, application of laser technologies, metal deposition method. Methods of development of latent prints on skin.		15
III	Latent print processing: Systematic approach to latent print processing, preserving and lifting of fingerprints. Photography of fingerprints, comparison of fingerprints: basis of comparison, class characteristics, individual characteristics, and various types of ridge characteristics.		15

	Automatic Fingerprint Identification System (AFIS) and its variants, digital image processing of fingerprints and their enhancement. Presentation of expert evidence on fingerprints in court.	
IV	Foot/footwear/tire impressions: Introduction, class and individual characteristics, types, collection, preservation and forensic examination and evaluation of impressions, and gait pattern. Lip Prints and Ear Prints: Nature, Location, Collection, Forensic Examination, and Significance.	15
Total Contact Hours		60
Suggested Evaluation Methods		
Internal Assessment: 30		End Term Examination: 70
➤ Theory	30	➤ Theory: 70
• Class Participation:	5	Written Examination
• Seminar/presentation/assignment/quiz/class test etc.:	10	
• Mid-Term Exam:	15	
Part C-Learning Resources		
Recommended Books/e-resources/LMS:		
1. B.R. Sharma, Forensic Science in Criminal Investigation and Trials, Universal Law Publishing, 2013. 2. Bridges BC: Criminal Investigation, Practical Finger Printing, Thumb Impressions, Hand writing Expert testimony opinion Evidence, University Book Agency, Allahabad. 3. Cowger, James F: Friction ridge skin- Comparison and Identification of fingerprints, CRC Press, 1993. 4. William J. Bodziak: Footwear Impression Evidence Elsevier Science Publishing Co. New York. 5. R. Saferstein: Forensic Science Handbook, Vol.-I, II, Prentice Hall, NJ, 1988. 6. C. Champod et al. Ridge skin impression, CRC Press, London, 2004. 7. Richard Saferstein. Criminalistics: An Introduction to Forensic Science. 10th edit. Prentice-Hall, New Jersey.		

Session: 2025-26			
Part A – Introduction			
Name of Programme	M.Sc. Forensic Science		
Semester	4		
Name of the Course	Forensic Genetics, Serology and Bioinformatics		
Course Code	M24-FSC-403		
Course Type	DEC-3		
Level of the course	500-599		
Pre-requisite for the course (if any)	Science Subjects at UG Level		
Course Learning Outcomes (CLO)	CLO1: The students will be able to understand genetics use in solving paternity tests and other issues. CLO2: Students will gain knowledge of serological analysis of blood, semen, and other biological materials. CLO3: The students will be able to understand the blood protein polymorphism and their profiling methods. CLO4: The students will learn about bioinformatics tools for forensic analysis of various biological materials.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		
Part B-Contents of the Course			
Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.			
Unit	Topics		Contact Hours
I	Human Genetics: Human genetic variations. Mendelian Inheritance. Hardy-Weinberg Equilibrium. Mutation—their types and causes. Relevance of population genetics. Allele frequency, genotype frequency. Polymorphism and heterozygosity. Measures of genetic variations. Phenotypic and ancestry informative markers.		15
II	Forensic Serology: Blood groups – history, biochemistry, biosynthesis of ABO antigen. Genetics of ABO, Rh, MN and other blood group systems. Secretors and non-secretors, rare alleles. Bombay blood group. Blood identification – presumptive and confirmatory assays. Methods of ABO blood grouping from dried blood stains and other body fluids (absorption elution method, absorption inhibition method and mix-agglutination method), species identification from blood-Double Immunodiffusion Assays, Crossed-Over Electrophoresis. Forensic Protein Profiling: Erythrocyte Isoenzymes polymorphism. Role of sero-genetic markers in individualization, paternity disputes, and their limitations.		15
III	Identification of Vaginal Secretions and Menstrual Blood: Identification of Vaginal Stratified squamous epithelial cells, vaginal acid phosphatase, and vaginal bacteria Semen- composition, spermatozoa morphology, presumptive and confirmatory tests for semen- acid phosphatase, prosthetic antigen test (P30), vesicle specific		15

	antigen test, RNA based assay. Biochemistry: Chemistry of Carbohydrates - classification and their importance in forensic investigation. Chemistry of Lipids -Definition, classification and their importance in forensic investigation. Types and properties of amino acids, structure of proteins and their importance in forensic investigation.	
IV	Bioinformatics/ Bio computing: Biological data base- introduction, types, and importance. Forensic bioinformatics. Types of Bioinformatics Tools: Sequence Analysis Tools, structure analysis tools, functional analysis tools, application of bioinformatics tools. Common sequence file formats, FASTA, BLAST and other variants of BLAST, Multiple Sequence Alignment and Whole genome analysis. Bioinformatics analysis of DNA Microarray. Statistical evaluation of DNA profiles using Bioinformatics tools.	15
Total Contact Hours		60
Suggested Evaluation Methods		
Internal Assessment: 30		End Term Examination: 70
➤ Theory	30	➤ Theory: 70
• Class Participation:	5	Written Examination
• Seminar/presentation/assignment/quiz/class test etc.:	10	
• Mid-Term Exam:	15	
Part C-Learning Resources		
Recommended Books/e-resources/LMS:		
1. Richard Li. Forensic Biology: Identification and DNA Analysis of Biological Evidence, CRC Press. 2. Alan Gunn: Essential Forensic Biology, 2 nd Edition, John Wiley and Sons. 2009. 3. Chowdhari, S., Forensic Biology B.P.R. &D, Govt. of India 4. Gupta, S.K. “Essentials of Immunology”, Arya Publications, 2008. 5. Goodwin, William; “An Introduction to Forensic Genetics”, John Wiley & Sons Ltd. 2007. 6. John M. Butler: Forensic DNA Typing, 2nd Edition 7. Sharada Avadhanam et. al. Next Generation DNA Led Technologies, 1st ed. (2016), Springer, ISBN: 978-981-287-669-0 8. Balding, I. Moltke and J. Marioni Handbook of Statistical Genomics, 1st ed. (2019), Wiley, ISBN: 9781119487845. 9. J.-M. Claverie, C. Notredame, Bioinformatics for dummies.		

Session: 2025-26			
Part A – Introduction			
Name of Programme	M.Sc. Forensic Science		
Semester	4		
Name of the Course	Forensic Pharmacology and Drug Analysis		
Course Code	M24-FSC-404		
Course Type	DEC-4		
Level of the course	500-599		
Pre-requisite for the course (if any)	Science Subjects at UG Level		
Course Learning Outcomes (CLO)	CLO1: The students will be able to understand pharmacokinetics and metabolism of drugs and their metabolic fates of forensic interest. CLO2: To understand detailed chemistry and analysis methods of narcotics and barbiturates and benzodiazepines. CLO3: The students will be able to understand the characteristics of stimulant and hallucinogen compounds and their analysis by spectroscopy and GC-MS. CLO4: The students will learn classical and automated methods of drug analysis from various biological materials.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		
Part B-Contents of the Course			
Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.			
Unit	Topics	Contact Hours	
I	Forensic Pharmacology: Concepts of pharmacology, basic concepts of pharmacokinetics, route of administration of drugs, absorption—first-pass metabolism, bioavailability, bioequivalence and bioaccumulation, efficacy and potency, various biological barriers, dose-response relationship, distribution, elimination of drugs—drug half-life, excretion. Ferguson's principle. Drug Therapeutic Index. Drug Metabolism—Phase 1 and Phase 2 Reactions. Factors affecting the pharmacokinetics of drugs. Pharmacodynamics and pharmacogenesis. Metabolism of ethanol, methanol.	15	
II	Narcotic Drugs and Psychotropic Substances: Classification of narcotic substances, NDPS Act. Drugs of abuse. Opiate: introduction of opium alkaloids, metabolism of morphine, codeine, and heroin. Analysis of opium alkaloids, using spot tests, microcrystal tests, TLC, spectroscopy, and GC-MS. Barbiturates and Benzodiazepines: Chemistry, types, metabolism, extraction and isolation from blood, urine, and viscera, characterization by spot tests, TLC, and IR spectrometry, and HPLC-MS.	15	
III	Stimulants and Hallucinogen Compounds: Stimulants—Amphetamines: introduction, metabolism, extraction isolation from blood, urine, viscera, etc., and their preliminary and confirmatory tests. Cocaine: introduction and analysis from biological materials.	15	

	Hallucinogens —cannabis, LSD, psilocybin, and mescaline: Introduction, preliminary and confirmatory tests. Analysis of Prohibited Drugs: Detection of anabolic steroids, peptide hormones, beta agonist, metabolic modulators, diuretics by different techniques.	
IV	Conventional drugs Extraction methods: Extraction of volatile compounds (distillation methods, headspace-GC). Principle of solvent extraction method: extraction and isolation of neutral non-volatile compounds and acidic and basic non-volatile compounds from viscera, blood, urine, and hair Advanced methods of sample Purification: Introduction of solid-phase extraction, solid-phase microextraction techniques, liquid-phase microextraction method, and supercritical fluid extraction (<i>SFE</i>) method.	15
Total Contact Hours		60
Suggested Evaluation Methods		
Internal Assessment: 30		End Term Examination: 70
➤ Theory	30	➤ Theory: 70
• Class Participation:	5	Written Examination
• Seminar/presentation/assignment/quiz/class test etc.:	10	
• Mid-Term Exam:	15	
Part C-Learning Resources		
Recommended Books/e-resources/LMS:		
1. John Joseph Fenton, TOXICOLOGY: A Case-Oriented Approach		
2. Javed I. Khan and Thomas J. Kennedy: Donnell R. Christian, Jr., Basic Principles of Forensic Chemistry, Humana Press.		
3. Lawrence Kobilinsky: Forensic Chemistry Handbook, A John Wiley & Sons, Inc., Publication.		
4. Beth E. Zedeck, Forensic Pharmacology, Chelsea House publisher.		
5. EGC Clarke, Analysis of drugs and poisons. 3 rd edition. Pharmaceutical press		
6. Toxicology Manual, Directorate of Forensic Science, New Delhi.		
7. THE NARCOTIC DRUGS AND PSYCHOTROPIC SUBSTANCES ACT, 1985.		
8. Toxicology Manual Directorate of Forensic Science, MHA Government of India, Scientific and Selective, New Delhi.		
9. Recommended Methods for the Identification and Analysis of Barbiturates and Benzodiazepines, United Nations Office on Drugs and Crime Vienna		

Session: 2025-26					
Part A– Introduction					
Name of the Programme		M.Sc. Forensic Science			
Semester		4			
Name of the Course		Practical based on Papers M24-FSC-401 to M24-FSC-402			
Course Code		M24-FSC-405			
CourseType		PC-7			
Level of the course		500-599			
Pre-requisite for the course (if any)		Science Subjects at UG Level			
Course Learning Outcomes (CLO)	CLO1: Students will be able to conduct forensic analysis of various pieces of evidence related to hit-and-run cases. CLO2: The student will be able to conduct forensic analysis of glass, paint, Fiber, and other clues of forensic significance. CLO3: Students will be research-oriented and able to innovate in the subdomains of forensic physics and pattern analysis. CLO4: The students will be acquainted with the comparison and identification of voice evidence.				
Credits		Theory	Practical	Total	
		0	4	4	
Teaching Hours per week		0	8	8	
Internal Assessment Marks		0	30	30	
End Term Exam Marks		0	70	70	
Max. Marks		0	100	100	
Examination Time		0	4 hours		
Part B-Contents of the Course					
Practicals				Contact Hours	
Practical Contents	1. Physical examination of glass fragments. 2. Density measurement of paints and glass by density gradient methods. 3. Comparison of soil samples using microscopic and density-gradient distribution of particles methods. 4. Comparison of tool marks with a comparison microscope. 5. Physical and chemical examination of paints. 6. Collection of plain and rolled inked fingerprints to identify patterns and ridge characteristics. 7. Analyze the fingerprints—1st, 2nd, and 3rd level details. 8. Developing and comparing latent fingerprints with powder, fuming, and chemical methods. 9. To prepare a cast of footwear/tire impression marks and their comparison. 10. To record footmarks by the tracing method. 11. Visit crime scene related to road accident and prepare report. 12. Examine vehicle in case of accident. 13. Recording, editing, processing, and conversion of audio files. Detection of tampering in audio file.			120	
Suggested Evaluation Methods					
Internal Assessment: 30			End Term Examination: 70		
➤ Practicum		30	➤ Practicum	70	
• Class Participation:		5	Lab record, Viva-Voce, write-up and		
• Seminar/Demonstration/Viva-voce/Lab records etc.:		10			

• Mid-Term Exam:	15	execution of the practical
Part C-Learning Resources		
Recommended Books/e-resources/LMS:		
1.	manual speaker identification & audio-video analysis, Directorate of Forensic Science Services Ministry of Home Affairs, Govt. Of India	Working procedure
2.	forensic physics, Directorate of Forensic Science MHA, Government of India.	Working Manual

Session: 2025-26				
Part A–Introduction				
Name of the Programme		M.Sc. Forensic Science		
Semester		4		
Name of the Course		Practical based on Papers M24-FSC-403 to M24-FSC-404		
Course Code		M24-FSC-406		
Course Type		PC-8		
Level of the course		500-599		
Pre-requisite for the course (if any)		Science Subjects at UG Level		
Course Learning Outcomes (CLO)		CLO1: The students will be able to examine narcotics drugs. CLO2: The students will be skilled forensic chemists who can handle modern techniques used for the analysis of narcotics and psychotropic substances. CO3: The students will learn classical and automated methods of drug analysis from various biological materials. CLO4. The students will be able to analyse biological evidence, protein profiling.		
Credits		Theory	Practical	Total
		0	4	4
Teaching Hours per week		0	8	8
Internal Assessment Marks		0	30	30
End Term Exam Marks		0	70	70
Max. Marks		0	100	100
Examination Time		0	4 hours	
Part B-Contents of the Course				
Practicals				Contact Hours
Practical Contents	1. Systematic identification of Narcotic Drugs and Psychotropic substances (opiates, cannabis and barbiturates, benzodiazepines and amphetamines) by spot colour tests. 2. U.V/Vis spectrophotometric analysis of barbiturates, benzodiazepine and amphetamines. 3. IR/FTIR analysis of drug of abuses. 4. Analysis of drugs and metabolites by GC-MS 5. Systematic analysis of plant alkaloids (Opium, Datura, Nicotine). 6. Systematic Forensic analysis of blood 7. Systematic Forensic analysis of semen 8. Extraction of proteins from various biological samples. 9. Protein estimation by different techniques. 10. SDS-PAGE for protein analysis 11. ELISA 12. Western Blotting			120
Suggested Evaluation Methods				
Internal Assessment: 30			End Term Examination: 70	
➤ Practicum	30		➤ Practicum	70
• Class Participation:	5		Lab record, Viva-Voce, write-up and execution of the practical	
• Seminar/Demonstration/Viva-voce/Lab records, etc.:	10			
• Mid-Term Exam:	15			
Part C-Learning Resources				
Recommended Books/e-resources/LMS:				
1. Laboratory Procedure Manual, Forensic Toxicology: DFS 2. Working Manual forensic biology, Directorate of Forensic Science Services, MHA, Government of India.				

Session: 2025-26			
Part A – Introduction			
Name of Programme	M.Sc. Forensic Science		
Semester	4		
Name of the Course	Entrepreneurship Approaches in Forensic Science		
Course Code	M24-FSC-407		
Course Type	EEC		
Level of the course	500-599		
Pre-requisite for the course (if any)	Science Subjects at UG Level		
Course Learning Outcomes (CLO)	1. Understand the meaning, scope, and purpose of entrepreneurship. 2. Learn the concept of management in profit and non-profit organizations. 3. Learn how a forensic scientist can become an entrepreneur. 4. The students will understand how a forensic scientist can discover business opportunities within the realm of entrepreneurship.		
Credits	Theory	Practical	Total
	2	0	2
Teaching Hours per week	2	0	2
Internal Assessment Marks	15	0	15
End Term Exam Marks	35	0	35
Max. Marks	50	0	50
Examination Time	3 hours		
Part B- Contents of the Course			
Instructions for Paper Setter: The examiner will set 9 questions, asking two questions from each unit and one compulsory question by taking the course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering the entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.			
Unit	Topics		Contact Hours
I	Introduction to Entrepreneurship: Entrepreneurship: introduction, concept, and types of entrepreneurs. Core elements of entrepreneurship; Factors affecting entrepreneurship development; Attributes of an entrepreneur; skill gap analysis. Innovation: meaning and types; Methods of protecting innovation: branding, trademarks, copyrights, patents, and registered design protection.		15
II	Introduction of Business: Methods and process of generating ideas; Assessing opportunities; Form of business organization. E- business models: meaning, features, e-commerce and e-markets, digital commerce, mobile commerce, e-governance in India, and e-business applications. Forensic marketing scenario.		15
III	Becoming a forensic entrepreneur: Characteristics of successful entrepreneur in forensic science: Leadership— meaning, definition, and difference between leaders and managers. Types and styles of leaders, leadership traits. Legal and regulatory aspects; Role of government organizations and schemes.		15
IV	Establishing a Forensic Startup: Need for a forensic startup; types of business plan, pitfalls to be avoided in preparation of a business plan.		15

	Steps to establish forensic startup: Physical and human resources; Forensic firms; Training and certification firms; Private practices; Forensic vendors; Private Laboratories; and Licensing.		
Total Contact Hours			60
Suggested Evaluation Methods			
Internal Assessment: 30		End Term Examination: 70	
➤ Theory	30	➤ Theory:	70
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		
Part C-Learning Resources			
Recommended Books/e-resources/LMS:			
1. Surjit Singha, Entrepreneurship in Forensic Science, ISBN-13: 9789391413866.			

DISSERTATION

(Note : If A Candidate is offered Dissertation Course, Then He/ She Will Also Study CC-11, Dec-4 & EEC From Above Courses of Semester 4)

4	Dissertation/ Project work	M24- FSC- 408	Dissertation/ Project work	D	12	26	0	0	0	-	0	300	300	-
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Course Learning Outcomes (CLO)

Students will be able to

CLO 1:Formulate a focused research question and design a robust, methodologically sound investigation to address it.

CLO 2:Employ appropriate experimental, analytical, or field techniques to collect, analyze, and interpret botanical data effectively.

CLO 3:Critically evaluate research findings in light of existing theories, and communicate results clearly through well-structured scientific writing and presentations.

CLO 4;Exhibit independence, time management, and scientific integrity throughout the research process, while responding thoughtfully to feedback and defending

Description

I

Each student is required to undertake a research project in a relevant area of Forensic Science. The outcome of this research will be compiled into a dissertation and submitted for evaluation at the end of the semester. Students will also present their dissertation before an external examiner. Both internal and external assessments of the project and training will be conducted as per the prescribed evaluation criteria.

Assessment Structure

Internal Assessment:

- Submission of Dissertation
- One Mid-Semester Progress Report and/or Presentation

External Assessment:

- Final Project Report (Dissertation)
- Viva-Voce Presentation before an External Examiner

Dissertation Report Submission Guidelines

1. Structure of the Dissertation Report:

The dissertation should include the following components in order:

- Cover page
- Certificate signed by the student and supervisor
- Table of contents
- Introduction
- Objectives
- Literature review
- Methodology
- Results and Discussion
- Conclusion
- References

2. Formatting Requirements:

- Paper size: A4
- Font: Times New Roman, size 12
- Line spacing: 1.5 (one and a half spacing)
- Printing: Double-sided (print on both sides of the paper)
- Length: The written portion should be between 40 to 60 pages

3. Submission Requirements:

- Students must submit **three hard-bound copies** of the dissertation along with a **CD** containing a soft copy, to the department by the specified deadline.

4. Evaluation and Presentation:

- The student will be required to **defend the dissertation/project work** through a formal **presentation before an external examiner** at the end of the semester.
- Marks will be awarded based on both the written report and the oral presentation.