SCHOOL OF STUDIES IN FORENISC SCIENCE
VIKRAM UNIVERSITY, UJJAIN (M.P.)

M.Sc. FORENSIC SCIENCE
(2 Year Program)

This Scheme is based on the ORDINANCE -14 (2) PRINCIPLE (13/05/2025), of M.P Higher education ministry and UGC guidelines of NEP 2020

Year/Semester	Courses Level	Core course/ Dissertation	Practicum Courses	Internship/ Apprenticeship /Seminar or VAC (CHM/ EESC)	Total Credits
First year					
Sem I	400	CC-11 (6 Credits)	PC-11 (4 Credits)	Internship/ Apprenticeship/ Seminar (2 Credits)	22
	400	CC-12 (6 Credits)	PC-12 (4 Credits)		
Sem II	400	CC-21 (6 Credits)	PC-21 (4 Credits)	VAC (CHM/ EESC) (2 Credits)	22
	500	CC-22 (6 Credits)	PC-22 (4 Credits)		

Year/Semester	Courses Level	Core course/ Dissertation	Practicum Courses	Seminar /Research Thesis/ Project/ Patent	Total Credits
Second year					
Sem III	500	CC-31 (6 Credits)	PC-31 (4 Credits)	Seminar (2 Credits)	22
	500	CC-32 (6 Credits)	PC-32 (4 Credits)		
Sem IV				/Research Thesis/ Project/ Patent (22 Credits)	22

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w.e.f. Session 2025–2026

Credit Distribution Overview

SEMESTER – I (CREDITS 22)

S. No.	Paper code	Course Component and Name of paper	Credit			Marks		Total Marks
			T	P	Total	Max. Int.	Max. Ext.	
1.	FSC-CC- 11	Forensic Science Investigation and Criminal Justice System: Theory	6	-	10	40	60	100
2.	FSC-PC- 11	Forensic Science Investigation and Criminal Justice System: Practical	-	4		40	60	100
3	FSC-CC-12	Forensic Physics, Ballistics & Cyber Theory	6	-	10	40	60	100
4	FSC-PC- 12	Forensic Physics, Ballistics & Cyber Practical	-	4		40	60	100
5.		Internship/ Apprenticeship/ Seminar	2	-	2	40	60	100
		Total Credits and Marks			22			500

**Abbreviations Used- Core (Major), Minor, MD: Multi/Inter-Disciplinary, AEC: Ability Enhancement, SEC: Skill Enhancement, DSE: Discipline Specific Elective, VOC: Vocational Course, VAC: Value Added Course.*

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Credit Distribution Overview

SEMESTER – II (CREDITS 22)

S.No.	Paper code	Course Component and Name of paper	Credit			Marks		Total Marks
			T	P	Total	Max. Int.	Max. Ext.	
1.	FSC-CC- 21	Instrumental Method- Physical, Chemical and Biological: Theory	6	-	10	40	60	100
2.	FSC-PC- 21	Instrumental Method- Physical, Chemical and Biological: Practical	-	4		40	60	100
3.	FSC-CC-22	Dactylography, Biometrics and Questioned Documents: Theory	6	-	10	40	60	100
4.	FSC-PC- 22	Dactylography, Biometrics and Questioned Documents: Practical	-	4		40	60	100
5.		VAC (CHM/ EESC)	2	-	2		100	100
		Total Credits and Marks			22			500

**Abbreviations Used- Core (Major), Minor, MD: Multi/Inter-Disciplinary, AEC: Ability Enhancement, SEC: Skill Enhancement, DSE: Discipline Specific Elective, VOC: Vocational Course, VAC: Value Added Course.*

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Credit Distribution Overview

SEMESTER – III (CREDITS 22)

S. No.	Paper code	Course Component and Name of paper	Credit			Marks		Total Marks
			T	P	Total	Max. Int.	Max. Ext.	
1.	FSC-CC- 31	Forensic Biology, Serology, DNA and Forensic Medicine: Theory	6	-	10	40	60	100
2.	FSC-PC- 31	Forensic Biology, Serology, DNA and Forensic Medicine: Practical	-	4		40	60	100
3.	FSC-CC- 32	Forensic Chemistry Toxicology and Pharmacology: Theory	6	-	10	40	60	100
4.	FSC-PC- 32	Forensic Chemistry Toxicology and Pharmacology: Practical	-	4		40	60	100
5.		**Seminar**	2	-	2	40	60	100
		Total Credits and Marks			22			500

**Abbreviations Used- Core (Major), Minor, MD: Multi/Inter-Disciplinary, AEC: Ability Enhancement, SEC: Skill Enhancement, DSE: Discipline Specific Elective, VOC: Vocational Course, VAC: Value Added Course.*

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Credit Distribution Overview

SEMESTER – IV (CREDITS 22)

S. No.	Paper code	Course Component and Name of paper	Course Type	Credit	Marks		
					Internal Examination Marks (40%)	University Examination Marks (60%)	Total Marks
1	FSC-CC-41	Research Thesis/ Project/ Patent	Core	22	200	300	500
		Grand Total		22			500

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Credit Distribution Overview

SEMESTER – I (CREDITS 22)

S.No.	Paper code	Course Component and Name of paper	Credit			Marks		Total Marks
			T	P	Total	Max. Int.	Max. Ext.	
1.	FSC-CC- 11	Forensic Science Investigation and Criminal Justice System: Theory	6	-	10	40	60	100
2.	FSC-PC- 11	Forensic Science Investigation and Criminal Justice System: Practical	-	4		40	60	100
3.	FSC-CC-12	Forensic Physics, Ballistics & Cyber Theory	6	-	10	40	60	100
4.	FSC-PC- 12	Forensic Physics, Ballistics & Cyber Practical	-	4		40	60	100
5.		Internship/ Apprenticeship/ Seminar	2	-	2	40	60	100
		Total Credits and Marks			22			500

**Abbreviations Used- Core (Major), Minor, MD: Multi/Inter-Disciplinary, AEC: Ability Enhancement, SEC: Skill Enhancement, DSE: Discipline Specific Elective, VOC: Vocational Course, VAC: Value Added Course.*

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This Scheme is based on the ORDINANCE -14 (2) PRINCIPLE (13/05/2025), of M.P Higher education ministry and UGC guidelines of NEP 2020

Theory Paper: Scheme B-1 for Two-year PG program			
Program	**Class: M.Sc. I semester**	**Year: 2025**	**Session: 2025-26**
Subject: Forensic Science			
1	Course Code	FSC-CC-11	
2	Course Title	*Forensic Science Investigation and Criminal Justice System: Theory*	
3	Course Type		
4	Pre-Requisite (if any)		
5	Course Learning Outcome (CLO)	**The fundamental principles and functions of forensic science and their significance to human society, the art of collecting, packaging, and preserving different types of physical and trace evidence at crime scenes, the importance of chain of custody, different types of crime scenes; various tools and techniques for analysis of different types of crime scene evidence and their processing in courts.**	
6	Credit Value	6	
7	Total Marks	**Max. Marks: 100**	**Minimum Passing Marks: 40**

Unit	Topics	No. Of Lectures
I	**Foundations of Forensic Science and Ethical Framework:** The History and Development of Forensic Science, The Nature and Scope of Forensic Science. Organizational Structure of Forensic Science Laboratories at Central & State Level. Ethics in Forensic Science. Basic principles and its significance. **Concept of Dharma, Nyaya (justice), and Satya (truth)**	14
II	Definition, Theories of Causation of Crime: Pre-Classical and Neo-Classical, Constitutional, Geographical, Economic, Psychological, Sociological, Multiple Causation Approach. General Factors of Crime, Forms of Punishment in Brief, Radical Theory of Crime. Scene of Crime: Types, Protection of Scene of Crime, Crime Scene Documentation, Note Taking, Videography, Photography and Sketching Methods. Physical Evidence: Meaning, Types, Searching Methods, Collection and Preservation, Forwarding. chain of custody. Collection, Preservation, Packing and Forwarding of: Blood, Semen and Other Biological Stains, Firearm Exhibits, Documents, Fingerprint, Viscera, Hair & Fiber, Glass, Soil and Dust, Petroleum Products, Drugs and Poisons, etc. Investigation of the Following Crimes: Murder, Theft and House Breaking, Road Accident, Railways	22

	and Air Accidents, Arson, Sexual Assault Cases, Dowery Cases and Explosion Cases.	
II	Elements of Crime Scene Management- Information Management, Technology Management, Man-Power Management, and Logistic Management. An Introduction to Crime Scene Reconstruction, The Nature of Reconstruction, Physical Evidence and Reconstruction (Recognition, Identification, Individualization, and Reconstruction), Stages in Reconstruction, Types of Reconstruction, Pattern. Evidence in Reconstruction (Bloodstain Pattern Analysis for Reconstruction, Glass Fracture Pattern Fire Burn Patterns, Tire and Skid Mark Patterns), Shooting Scenes, Requirements for Reconstruction after Crime Scene Released, Writing a Reconstruction Report.	18
IV	Bhartiya Nyaya Sanhita (2023): Introduction, General Exceptions, Offences against Person, Offences against Property, Attempt to Suicide, Sexual Offences. Bhartiya Nagarik Suraksha Sanhita (2023): Introduction and General Idea of Sections: 173, 174, 175, 176,177, 178,179, 180, 181, 192,193, 194, 195 and 196. Bhartiya Sakshya Adhiniyam (2023): Introduction and General Idea of Sections: 26, 39, 40, 41, 52, 53, 55, 72,140, 141,142 and 162.	18
V	Organization of Police in India, Organization of Courts in Courts Cases, Prosecution, F.I.R., Case Diary, Interrogation of Suspects, Interview of Witness, and Procedure in Court as Per Bhartiya Nagarik Suraksha Sanhita: Trial of Summons, Trial of Warrant, and Summary Trial. Report Writing and Evidence Evaluation Report Formats of Crime Scene and Laboratory Findings court Testimony: Admissibility of Expert Testimony, Pre Court Preparation and Court 18 Appearance	18
	Keywords/Tags: Evidence Investigation, Forensics, Analysis, Justice	

Textbooks, Reference Books, Other Resources

Suggested Readings:

1. Ahuja R. (2001). Criminology. India, Rawat Pub.
2. Aitken C.G.G. & Stoney, D.A. (1991). The Use of Statistics in Forensic Science. England,Ellis Harwood Limited.
3. Bowen R.T. (2016). Ethics and the Practice of Forensic Science. USA, CRC Press.
4. Burke R.H. (2013). An Introduction to Criminological Theory, 4th ed., UK, Routledge-Taylor & Francis Group.
5. Horswell J. (2016). The Practice of Crime Scene Investigation. USA, CRC Press.
6. Indian Penal Code, Criminal Procedure Code, Indian Evidence Act.
7. James, S.H., and Nordby, J.J. (2003). Forensic Science: An Introduction to Scientific and Investigative Techniques. USA, CRC Press.
8. James S.H. (2014). Forensic Science: An Introduction to Scientific and Investigative Techniques. UK Taylor& Francis.
9. Nordby J. (1999). Dead Reckoning-The Art of Forensic Science Detection. USA, CRC Press.
10. O'Hara & Osterberg, (1949). An Introduction to Criminalistics. New York, The Macmillan Company.

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Suggested Continuous Evaluation Methods: **Maximum Marks: 100** **Continuous Comprehensive Evaluation (CCE): 40**			**University Exam (UE): 60**
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Mid-Semester Test (MST)	20	Term End Exam	60
Teacher Assessment* (TA) and Class attendance	20		
Total	**40**		**60**

Teacher Assessment* Presentation/Assignment/Quiz/Group-Discussion etc.

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Practical Paper: SchemeB-1 for Two Year PG Program

Program			
Subject: Forensic Science	Class: M.Sc. I semester	Year: 2025	Session: 2025-26
1	Course Code	(FSC-PC-11)	
2	Course Title	*Forensic Science Investigation and Criminal Justice System: Practical*	
3	Course Type		
4	Pre-Requisite (if any)		
5	Course Learning Outcome (CLO)	Crime scene management and photography; different searching methods of crime scenes; different methods of crime scene sketching; collection, packing, labelling, and forwarding of physical evidence from the crime scene to the forensic science laboratory, methods of crime scene reconstruction.	
6	Credit Value	4	
7	Total Marks	**Max. Marks: 100**	**Minimum Passing Marks: 40**

Total No. Of Lectures-Tutorial-Practical (in hours per week): L-T-P:

Topics	No. of Lectures
. Demonstration of Crime Scene Management. 2. Photography of Scene of Crime Digital Camera. 3. Methods for Searching for Physical Evidence at the Scene of Crime. 4. Sketching of an Outdoor Scene of Crime (Homicide or Suicide). 5. Sketching of an Outdoor Scene of Crime (Accident). 6. Sketching of Indoor Scene of Crime (Theft or Dacoity or Robbery). 7. Sketching of an Indoor Scene of Crime (Murder or Suicide). 8. Sketching of a Mobile Scene of Crime (Hit & Run Case). 9. Collection, Packing, Labelling and Forwarding of Physical Evidence from Scene of Crime to Forensic Science Laboratory.	

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0. Reconstruction of a Scene of Crime.	

Keywords/Tags: Evidence Investigation, Scene of Crime, Sketching, Searching

Keywords/Tags: Evidence Investigation, Scene of Crime, Sketching, Searching

1. Ahuja R. (2001). Criminology. India, Rawat Pub.
2. Aitken C.G.G. & Stoney, D.A. (1991). The Use of Statistics in Forensic Science. England, Ellis Harwood Limited.
3. Bowen R.T. (2016). Ethics and the Practice of Forensic Science. USA, CRC Press.
4. Burke R.H. (2013). An Introduction to Criminological Theory, 4th ed., UK, Routledge-Taylor & Francis Group.
5. Horswell J. (2016). The Practice of Crime Scene Investigation. USA, CRC Press.
6. Indian Penal Code, Criminal Procedure Code, Indian Evidence Act.
7. James, S.H., and Nordby, J.J. (2003). Forensic Science: An Introduction to Scientific and Investigative Techniques. USA, CRC Press.
8. ames S.H. (2014). Forensic Science: An Introduction to Scientific and Investigative Techniques. UK,Taylor& Francis.
9. Nordby J. (1999). Dead Reckoning-The Art of Forensic Science Detection. USA, CRC Press.
10. O'Hara & Osterberg, (1949). An Introduction to Criminalistics. New York, The Macmillan Company.

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 40 University Exam (UE): 60

Internal Assessment	Marks	External Assessment	Marks
Internal Test, Teacher Assessment* (TA) and Class Attendance	40	Term End Exam	60
Total	**40**		**60**

Teacher Assessment* Demonstration/Viva-Voce/Lab record etc.

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Theory Paper: Scheme B-1 for Two-year PG program			
Program	**Class: M.Sc. I semester**	**Year: 2025**	**Session: 2025-26**
Subject: Forensic Science			
1	Course Code	**FSC-CC-12**	
2	Course Title	Forensic Physics, Ballistics & Cyber Theory	
3	Course Type		
4	Pre-Requisite (if any)		
5	Course Learning Outcome (CLO)	Understanding firearms and their ammunition, Different fields of forensic ballistics which include Internal Ballistics, External and Terminal ballistics, Methods of investigation in shooting cases.	
6	Credit Value	6	
7	Total Marks	**Max. Marks: 100**	**Minimum Passing Marks: 40**

Total No. Of Lectures-Tutorial-Practical (in hours per week): L-T-P:		
Unit	Topics	No. Of Lectures
I	**Introduction:** Density, Refractive Index, Birefringence; Other Optical Properties of Crystalline Material. Examination of the Following- 1. Hair and Fiber 2. Soil 3. Dust 4. Paints 5. Glass 6. Glass Fracture 7. Tool Marks 8. Explosives Restoration of Erased / Obliterated Marks. Examination of Wire/ Cables. Counterfeit Coins. Physical Matching of Severed / Broken Objects. Speaker Identification and Tape Authentication: Voice Production Theory- Vocal Anatomy, Speech Signal Processing & Pattern Recognition- Basic Factors of Sound in Speech, Acoustic Characteristics of Speech Signal, Fourier Analysis, Frequency & Time Domain Representation of Speech Signal, Analogue to Digital Signal and Conversion, Fast Fourier Transform, Quantization, Digitization, and Speech Enhancement, Analysis of Audio-	14

	Video Signal for Authenticity, Introduction to the Techniques of Pattern Recognition and Comparison.	
II	**History and background, their classification and characteristics,** Shotgun and rifled firearms (including pistols, revolvers and assault rifles), Various Components of Firearms: Barrel: chamber,leed, bore (calibre and its nomenclature Rifling, Purpose of Rifling, Types of Rifling), Action: its components and various types including manual, semiautomatic and automatic stock Improvised/Country-Made/Imitative Firearms and their Constructional Features. Ammunition:,Classification and Constructional Features of Different Types of Cartridges, Types of Primers and Priming Composition, Propellants and their Compositions, Various Types of projectiles, Bullets and Compositional Aspects, Safety Aspects for Handling Firearms. **Traditional Indian warfare technologies: bows, arrows, catapults, and projectiles in Dhanurveda and Shastra Vidya.**	22
III	Definition, Ignition of Propellants, Shape and Size of Propellants, Manner of Burning, Various Factors affecting the Internal Ballistics, Theory of recoil, Exterior Ballistics, Vacuum Trajectory, Effect of external and internal factors on Trajectory of cylinder-conoidal bullets and shotgun projectiles, Ricochet bullets, maximum and effective range. Concept of wound formation, Temporary and Permanent Cavities, Threshold Velocity for Penetration of Skin/Flesh/Bones, Effect of various types of projectiles on hitting the target, effect of various factors on wound formation: function of bullet shape, striking velocity, striking angle of intermediate target, tumbling of bullets, effect of instability of bullets, effect of intermediate targets, influence of range, yaw, stopping power.	18
IV	**Identification of Firearms** -Matching of crime and test: Principles and Practice of Identification of Firearms with fired projectiles in regular firearms and country made firearms. Gun-shot residue: its formation and analysis (chemical and instrumental methods), Reconstruction of crime scene: Range of fire, Time of Fire, Different Method Employed and their Limitations. **Firearm Injuries**- Nature of Wounds of Entry, Exit, and Initial Track with Various Ranges and Velocities with Evaluation of Injuries Caused by Shot-Gun, Rifle, Handguns, and Country Made Firearms, Post-Mortem and Antemortem Firearm Injuries.	18
V	What is Computer Forensic? Basic Introduction to Computers, Hardware and Accessories, Operating Systems and Software. Cyber Crime- Definition, Crimes on Internet, Hacking, Virus, Worms, Cookies, Obscenity and Pornography. Programme Manipulation. Software Piracy, Intellectual Property and Computer Security. Encryption and Decryption Methods. What is Computer Forensic? Basic Introduction to Computers, Hardware and Accessories, Operating Systems and Software. Cyber Crime- Definition, Crimes on Internet, Hacking, Virus, Worms, Cookies, Obscenity and	18

	Pornography. Programme, Manipulation. Software Piracy, Intellectual Property and Computer Security. Encryption and Decryption Methods.	
Keywords/Tags: Computer Forensic, Firearms, Ballistics, Bullets		

Textbooks, Reference Books, Other Resources

Suggested Readings:

1. Bengold & Moryson N. (1999). Speech and Audio Signal Processing. USA, John Wiley & Sons.
2. Caddy B. (2001). Forensic Examination of Glass and Paint Analysis and Interpretation. UK, Taylor and Francis.
3. Hatcher, Jury, & Weller (1977). Firearms Investigation, Identification, and Evidence. Harrisburg, Stackpole Books.
4. Heard B.J. (1997). Handbook of firearms and ballistics. London, John Willey.
5. Hogg. V. (1982). The Cartridges Guide - A Small Arms Ammunition Identification Manual. Harrisburg, The Stackpole Co.
6. Jenkins and White, (2003). Fundamentals of Optics. USA, McGraw Hill.
7. Johari M. (1980). Identification of Firearms, Ammunition and Firearms Injuries. India, BPR&D.
8. Maio V.D. (1999). Gunshot Wounds. US, CRC Press.
9. Mathews, J.H. & Thomas, C.C. (1973). Firearms Identification, Vols. 1, 2, & 3. Illinois, Springfield.
10. Murray, R.C. & Tedrew J.C.F. (1991). Forensic Geology. New Jersey, Prentice Hall.
11. Bayuk J. (2010). Cyber Forensics: Understanding Information Security Investigations. NY, Springer.
12. Santanam R., Sethu madhawan M. (2010). Cyber Security, Cyber Crime and Cyber Forensics: Applications and Cyber Forensics: Applications and Perspectives. NY, Information Science Reference

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 40 **University Exam (UE): 60**

Internal Assessment	**Marks**	**External Assessment**	**Marks**
Mid Semester Test (MST)	20	Term End Exam	60
Teacher Assessment* (TA) and Class attendance	20		
Total	**40**		**60**

Teacher Assessment* Presentation/Assignment/Quiz/Group-Discussion etc.

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Theory Paper: Scheme B-1 for Two-year PG program			
Program	**Class: M.Sc. I semester**	**Year: 2025**	**Session: 2025-26**
Subject: Forensic Science			
1	Course Code	**FSC-PC-12**	
2	Course Title	Forensic Physics, Ballistics & Cyber Practical	
3	Course Type		
4	Pre-Requisite (if any)		
5	Course Learning Outcome (CLO)	Understanding of the density gradient method for matching soil, glass, glass fractures and the refractive index of glass. Chemical treatment of erased tool marks, lifting and casting of footmarks, tyre marks, handling of a comparison microscope.	
6	Credit Value	4	
7	Total Marks	**Max. Marks: 100**	**Minimum Passing Marks: 40**

Total No. Of Lectures-Tutorial-Practical (in hours per week): L-T-P:

Topics	No. of Lectures
1. Identification and Matching of Dust/ Soil Sample by Physical Method (Including Density Gradient Method). 2. Physical Matching of Cloth Sample and Identification of Glass Fractures. 3. Calculate the refractive index of glass with Abbe's Refractometer. 4. Restoration of an Erased Punched Mark on a Metal Piece by Chemical Treatment. 5. Comparison of Tool Marks and Fired Cartridge/ Bullet Using Comparison Microscope. 6. Identification of Shots and Pellets. 7. Collection and Handling of Digital Evidence. 8. Detection of Origin of e-Mails (IP Address) etc. 9. Data recovery from various storage devices by using data recovery software.	

Keywords/Tags: Computer Forensic, Firearms, Ballistics, Bullets

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Textbooks, Reference Books, Other Resources
Suggested Readings: 1. Bengold & Moryson N. (1999). Speech and Audio Signal Processing. USA, John Wiley & Sons. 2. Caddy B. (2001). Forensic Examination of Glass and Paint Analysis and Interpretation. UK, Taylor and Francis. 3. Hatcher, Jury, & Weller. (1977). Firearms Investigation, Identification, and Evidence. Harrisburg, Stackpole Books. 4. Heard B.J. (1997). Handbook of Firearms and Ballistics. London, John Willey. 5. Hogg, V. (1982). The Cartridges Guide – A Small Arms Ammunition Identification Manual. Harrisburg, The Stackpole Co. 6. Jenkins and White, (2003). Fundamentals of Optics. USA, McGraw Hill. 7. Johari M. (1980). Identification of Firearms, Ammunition and Firearms Injuries. India, BPR&D. 8. Maio V.D. (1999). Gunshot Wounds. US, CRC Press. 9. Mathews, J.H. & Thomas, C.C. (1973). Firearms Identification, Vols. 1, 2 & 3. Illinois, Springfield. 10. Murray, R.C. & Tedrew J.C.F. (1991). Forensic Geology. New Jersey, Prentic Hall. 11. Santanam R., Sethumadhawan M. (2010). Cyber Security, Cyber Crime and Cyber Forensics: Applications and Cyber Forensics: Applications and Perspectives. NY, Information Science Reference. 12. Wiles J., Reyes A. (2007). The Best Damn Cybercrime and Digital Forensics Book Period. US, Elsevier. 13. Nelson B., Philips A., Steuart C. (2014). Guide to Computer Forensics and Investigations. US, Cengage Learning.

Teacher Assessment* Demonstration/Viva-Voce/Lab record etc.

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 40 **University Exam (UE): 60**

Internal Assessment	Marks	External Assessment	Marks
Internal Test, Teacher Assessment* (TA) and Class Attendance	40	Term End Exam	60
Total	**40**		**60**

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Internship/ Apprenticeship/ Seminar (2 Credits)

Theory Paper: Scheme B-1 for Two-year PG program			
Program	Class: M.Sc. I semester	Year: 2025	Session: 2025-26
Suggested Continuous Evaluation Methods:			
Maximum Marks: 100 • Seminar: Internal Evaluation only • Internship/Apprenticeship: Marks to be allotted by the concerned organization			

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Credit Distribution Overview

SEMESTER – II (CREDITS 22)

S. No.	Paper code	Course Component and Name of paper	Credit			Marks		Total Marks
			T	P	Total	Max. Int.	Max. Ext.	
1	FSC-CC- 21	Instrumental Method- Physical, Chemical and Biological: Theory	6	-	10	40	60	100
2	FSC-PC- 21	Instrumental Method- Physical, Chemical and Biological: Practical	-	4		40	60	100
3	FSC-CC-22	Dactylography, Biometrics and Questioned Documents: Theory	6	-	10	40	60	100
4	FSC-PC- 22	Dactylography, Biometrics and Questioned Documents: Practical	-	4		40	60	100
5.		VAC (CHM/ EESC)	2	-	2		100	100
		Total Credits and Marks			22			500

**Abbreviations Used- Core (Major), Minor, MD: Multi/Inter-Disciplinary, AEC: Ability Enhancement, SEC: Skill Enhancement, DSE: Discipline Specific Elective, VOC: Vocational Course, VAC: Value Added Course.*

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16.7.25

SCHOOL OF STUDIES IN FORENISC SCIENCE
VIKRAM UNIVERSITY, UJJAIN (M.P.)

M.Sc. FORENSIC SCIENCE
(2 Year Program)

This Scheme is based on the ORDINANCE -14 (2) PRINCIPLE (13/05/2025), of M.P Higher education ministry and UGC guidelines of NEP 2020

Theory Paper: Scheme B-1 for Two-year PG program			
Program	Class: M.Sc. II semester	Year: 2025	Session: 2025-26
Subject: Forensic Science			
1	Course Code	FSC-CC- 21	
2	Course Title	Instrumental Method- Physical, Chemical and Biological: Theory	
3	Course Type		
4	Pre-Requisite (if any)		
5	Course Learning Outcome (CLO)	Understanding about the sample preparation, handling and extraction techniques, the basic principle and working of chromatographic and spectroscopic technique that could lead to professional job opportunities in testing and pharmaceutical laboratories, the basic principle and working of spectroscopy, microscopy and other analytical instruments	
6	Credit Value	6	
7	Total Marks	**Max. Marks: 100**	**Minimum Passing Marks: 40**

Total No. Of Lectures-Tutorial-Practical (in hours per week): L-T-P:		
Unit	Topics	No. Of Lectures
I	Instrumental Approach (Sample, Sampling, Storage of Samples), Simple Sample Separation (Distillation, filtration, evaporation, and crystallization. Solvent Extraction techniques like LLE, SPE, Micro SPE and Distribution Law) and Preparation (Acid Dissolution &; Digestion, Fusions, Dry Ashing and Combustion), Basic Statistics and Data Handling (Significant Figures, Accuracy and Precision, Types of Errors, Quantifying Random Error, Rejection of Results), Performing the Measurement (Signals and Noise, Plotting Calibration Curves), Assessing the Data (Limit of Detection, Limit of Quantification).	14
II	General Idea on Spectroscopy, Electromagnetic Spectrum, Various Sources of Radiation and their utility and limitations, Interaction of Radiation with	22

	Matter, i.e., Reflection, Absorption, Fluorescence, Phosphorescence, Diffraction, Refraction, etc. Detection of Radiation, i.e., Photography, Photoelectric, etc. Introduction to optical systems used in Spectroscopy (Wavelength Selection Devices, Optical Slits, Detectors, Single-Beam and Double-Beam Optics), Dispersive Optical Layouts, and Fourier Transform Spectrometers. Forensic Applications of Spectroscopy.	
II	Atomic Spectra – Energy Level, Quantum Number and Designation of States, Selection Rule. Molecular Spectra – Quantitative Discussion of Molecular Bindings, Molecular Orbital, Types of Molecular Energies, Discussion of Rotational, Vibrational, and Electronic Spectra. Ultraviolet-Visible and Infrared Spectrophotometry: Basic Principles, Instrumentation, Qualitative and Quantitative Analysis, Interpretation of Spectra, etc. Quantitative Analysis through Ultraviolet-Visible Spectroscopy, Forensic Application of UV-Vis. and IR Spectrophotometry. Mass Spectrometry: Principle and Instrumentation. Correlation of MS with Molecular Structure. A brief idea about the various forms of Mass Spectrometry Coupling with other instruments. Application of MS in Forensic Science. Radiochemical Techniques: Basic Principles and Theory, Introduction about Nuclear Reactions and Radiations, Neutron Activation Analysis (NAA), Nuclear Magnetic Resonance Spectroscopy (NMR)	18
IV	General Idea of Chromatography: Historical Aspect of Chromatography, Classification of Chromatography (Mobile Phase Mode, Technique, Development Mode, Separation Mechanism &; other Systems of Classification), Theory and Classification of Chromatography (Planar and Column Chromatography, Adsorption and Partition Chromatography, Ion Exchange Chromatography, Exclusion Chromatography, Affinity Chromatography). Principles, Working and Forensic Application of Planar Chromatography; TLC, PC, HPTLC. General Principles, Working and Forensic Application of Column Chromatography. General Idea on Working of HPLC and GC. Forensic Application of Chromatography.	18
V	Gel Electrophoresis, Isoelectric Focusing, etc. General Idea and Working of Gel Electrophoresis, PAGE, SDS-PAGE, Capillary Electrophoresis, Forensic Application of Electrophoresis. Production of Antibodies, Precipitation Reaction, Gel Immunodiffusion, Immune-Electrophoresis, Complement Fixation. Molecular Biology Techniques, DNA Profiling and Microfluidics. Outline of Genetic Manipulation Enzymes, Enzymes in Genetic Manipulation, Cloning Procedures, Isolation of Specific Nucleic Acid Sequences – Complementary DNA, Gene Libraries, Colony Hybridization, Nick Translation, Oligo-nucleotide Probes, Expression of Genes. DNA Profiling: Structure of DNA and its Polymorphic Marker, Basis of DNA Typing and Techniques: PCR, RFLP, etc. Introduction of Microfluidics. Theory and Forensic Applications.	18
	Keywords/Tags: Electrophoresis, Chromatography, Spectroscopy, Separation	

16.9.25

Suggested Readings:

1. Chatwal and Anand. (2016). Instrumental Methods of Chemical Analysis. India, Himalaya Publishing House Pvt. Ltd.
2. Churáček J. (1993). Advanced Instrumental Methods of Chemical Analysis. Michigan, E. Harwood.
3. Dean J. A. (1995). Analytical Chemistry Handbook. USA, McGraw Hill Inc.
4. Kalri P.S. (2001). Spectroscopy of Organic Compounds. India, New Age International Pub.
5. Khandpur R.S. (2004). Handbook of Analytical Instruments. USA, Tata McGraw Hill Pub. Co.
6. Khanna D.R. & Gulati H.R. (2002). Fundamentals of Optics Geometrical Physical & Quantum. India, R. Chand & Co.
7. Robards K. Jackson P.E. & Haddad P.A. (2012). Principles and Practice of Modern Chromatographic Methods. Germany, Elsevier Pub.
8. Saferstein R. (2001). Forensic Science Handbook Vol. 1. London, Prentice Hall.
9. Edwin & Caney, H. M. (1993). Human Genetics: The Molecular Revolution. London, Jones & Bartlett Pub.
10. Epplen J. T., and Lubjumhin, T. (1995). DNA Profiling and DNA Fingerprinting. Basel, Birkhäuser Verlag.
11. Gardner E.J., Simmons M.I. & Snustad D.P. (1991). Principles of Genetics. New York, John Wiley.
12. Glover, D.M., & Hames, B.D. (1995). DNA Cloning, Vol. 1 to 4. England, Oxford University Press, Oxford Pub.
13. Joshi A. R. (2002). A Textbook of Practical Biochemistry. India, B. Jain Publishers.

Teacher Assessment* Presentation/Assignment/Quiz/Group-Discussion etc

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 40 **University Exam (UE): 60**

Internal Assessment	**Marks**	**External Assessment**	**Marks**
Mid-Semester Test (MST)	20	Term End Exam	60
Teacher Assessment* (TA) and Class attendance	20		
Total	**40**		**60**

SCHOOL OF STUDIES IN FORENISC SCIENCE
VIKRAM UNIVERSITY, UJJAIN (M.P.)

M.Sc. FORENSIC SCIENCE
(2 Year Program)

This Scheme is based on the OR DINANCE -14 (2) PRINCIPLE (13/05/2025), of M.P Higher education ministry and UGC guidelines of NEP 2020

Theory Paper: Scheme B-1 for Two-year PG program			
Program	Class: M.Sc. II semester	Year: 2025	Session: 2025-26
Subject: Forensic Science			
1	Course Code	FSC-PC- 21	
2	Course Title	Instrumental Method- Physical, Chemical and Biological: Practical	
3	Course Type		
4	Pre-Requisite (if any)		
5	Course Learning Outcome (CLO)	Understanding about the sample preparation techniques, sample handling And extraction techniques, qualitative and quantitative analysis, the basic principle and working of chromatographic techniques like TLC, HPTLC, HPLC, GC, etc and spectroscopic technique like UV spectroscopy, FTIR, etc.	
6	Credit Value	4	
7	Total Marks	**Max. Marks: 100**	**Minimum Passing Marks: 40**

Total No. Of Lectures-Tutorial-Practical (in hours per week): L-T-P:

Topics	No. of Lectures
1. To Measure the pH of Different Substance using pH Meter. 2. To Know the Concentration of Given Liquid by Colorimeter. 3. Sample Preparation and Analysis of Drugs of Abuse by using UV-Visible Spectrophotometer. 4. To separate and identify plant pigments by paper chromatography. 5. To know the Practical Working and Handling of High-Performance Thin Layer Chromatography by analyzing the ink sample. 6. To know the Practical Working and Handling of High-Performance Liquid Chromatography by analyzing depressant drugs. 7. To know the Practical Working and Handling of Gas Chromatography by analyzing volatile poisons. 8. Demonstration of Handling and Working of PCR. 9. To Perform Protein Estimation of Given Biological Samples. 10. To Separate Cell Organelles in Given Tissues using Centrifuge. 11. Demonstration of Working and Handling of Gel Electrophoresis. 12. Demonstration of Working and Handling of Compound, Stereo Microscope, SEM and TEM.	

13. Demonstration of Working and Handling of the UV-Spectrophotometer for the Examination of Biological Samples.	

Textbooks, Reference Books, Other Resources
Suggested Readings: 1. Chatwal and Anand. (2016). Instrumental Methods of Chemical Analysis. India, Himalaya Publishing House Pvt. Ltd. 2. Churáček J. (1993). Advanced Instrumental Methods of Chemical Analysis. Michigan, E. Harwood. 3. Dean J. A. (1995). Analytical Chemistry Handbook. USA, McGraw Hill Inc. 4. Kalri P.S. (2001). Spectroscopy of Organic Compounds. India, New Age International Pub. 5. Khandpur R.S. (2004). Handbook of Analytical Instruments. USA, Tata McGraw Hill Pub. Co. 6. Khanna D.R. & Gulati H.R. (2002). Fundamentals of Optics Geometrical Physical & Quantum. India, R. Chand & Co. 7. Robards K. Jackson P.E. & Haddad P.A. (2012). Principles and Practice of Modern Chromatographic Methods. Germany, Elsevier Pub. 8. Saferstein R. (2001). Forensic Science Handbook Vol. 1. London, Prentice Hall. 9. (1978). Biology Methods Manual. London: Metropolitan Police Forensic Science Laboratory. 10. Albert S., Bray B., Lewis D., Roberts K., and Watson J.D. (1989). Molecular Biology of the Cell. New York, Garland Pub. 11. Clifford B.J. (1971). The examination and typing of bloodstains in the Crime Laboratory. USA, US Court Printing Press. 12. Edwin & Caney, H. M. (1993). Human Genetics: The Molecular Revolution. London, Jones & Bartlett Pub. 13. Epplen J. T., and Lubjumhin, T. (1995). DNA Profiling and DNA Fingerprinting. Basel, Birkhäuser Verlag.
Keywords/Tags: Electrophoresis, Chromatography, Spectroscopy, Separation

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 40 University Exam (UE): 60

Internal Assessment	Marks	External Assessment	Marks
Internal Test, Teacher Assessment* (TA) and Class Attendance	40	Term End Exam	60
Total	**40**		**60**

Teacher Assessment* Demonstration/Viva-Voce/Lab-Record, etc.

SCHOOL OF STUDIES IN FORENISC SCIENCE
VIKRAM UNIVERSITY, UJJAIN (M.P.)

M.Sc. FORENSIC SCIENCE
(2 Year Program)

This Scheme is based on the OR DINANCE -14 (2) PRINCIPLE (13/05/2025), of M.P Higher education ministry and UGC guidelines of NEP 2020

Theory Paper: Scheme B-1 for Two-year PG program			
Program	**Class: M.Sc. II semester**	**Year: 2025**	**Session: 2025-26**
Subject: Forensic Science			
1	Course Code	**FSC-CC- 22**	
2	Course Title	Dactylography, Biometrics and questioned Documents: Theory	
3	Course Type		
4	Pre-Requisite (if any)		
5	Course Learning Outcome (CLO)	Understanding about the basics of fingerprint, history, patterns & classification, types of fingerprints, location, development, photography & comparison, ear biometrics and iris recognition, retina biometrics and face recognition.	
6	Credit Value	6	
7	Total Marks	**Max. Marks: 100**	**Minimum Passing Marks: 40**

Total No. Of Lectures-Tutorial-Practical (in hours per week): L-T-P:		
Unit	Topics	No. Of Lectures
I	History of Fingerprints, Formation of Ridges, Different Fingerprint Patterns and Areas, Ridge Characteristics, Ridge Count, Ridge Tracing, Levels of Fingerprint Identification, Classification of Fingerprint- Henry system of classification, single digit classification, extension of the Henry system. Types of Fingerprint; Latent, Visible, and Plastic Prints, Location of Fingerprints; Development of Latent Prints by Physical and Chemical Methods. Photography and Comparison of Fingerprints, 3-D Development of Fingerprints Ancient Indian palmistry (Hasta Samudrika Shastra): Individual fingerprint patterns for personality and destiny.	14
II	Fingerprint Biometrics: Introduction to AFIS, Working of AFIS System, AFIS Components, Digitization & Processing of Fingerprints: Acquisition,	22

	Normalization & Segmentation, Enhancement, Binarization, Thinning & Post-processing, Minutiae Extraction, Fingerprint Matching in AFIS, Indexing & Retrieval. AMBIS- Integrated Biometric Identification System, CCTNS. Iris Recognition: Introduction, Anatomical and Physiological Underpinnings; Iris Signature Representation and Matching; Localization, Representation; Matching. Retina Biometrics: Structure of Eye; Human Retina and Structure; Unique Pattern of Blood Vessels; Retina Pattern and Identification	
III	Voice Production, Theory-Vocal Anatomy, Speech Signal Processing & Pattern Recognition- Basic Factors of Sound in Speech, Acoustic Characteristics of Speech Signal. An Introduction to the Techniques of Pattern Recognition and Comparison. Face Recognition and Facial Reconstruction Face Recognition: Introduction, Detection, Representation, and Classification, Techniques and their Applications. Facial reconstruction: 2D & 3D Facial reconstruction. Face reading and body proportion analysis to determine personality and identity (Samudrika Shastra and Ayurveda)	18
IV	Definition of Questioned Document, Types of Questioned Document, Collection, Preservation & Handling of Questioned Document, Photography of Questioned Document, Preliminary Examination of Questioned Document. Basic Tools Needed for Forensic Document Examination- Ultraviolet, Visible, Infrared, and Fluorescence Spectroscopy, Photomicrography, Microphotography, Visible Spectral Comparator, Electrostatic Detection Apparatus, Determining the Age and Relative Age of Documents.	18
V	Comparison of Handwriting, Development of Individuality in Handwriting, Natural Variations and Fundamental Divergences in Handwriting, Class & Individual Characteristics. Standards for Comparison of Handwriting. Comparison of Paper, Ink, Printed Documents, Typed Documents, Xeroxed Documents. Alterations in Documents, Including Erasures, Additions, Over-Writing, and Obliterations. Indented and Invisible Writings. Charred Documents. Examination of Counterfeit Indian Currency Notes, Passports, Visas, and Stamp Pads. Role of handwriting in resolving disputes in ancient India (Document examination in Dharmasastra)	18
Keywords/Tags: Comparison, Document, Voice, Biometrics		

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Suggested Readings:

1. James S. H. (2014). Forensic Science: An Introduction to Scientific and Investigative Techniques. USA, Taylor & Francis Group.
2. Ashbaugh D. R., (1999). Quantitative and Qualitative Friction ridge analysis. NY, CRS Press.
3. Daluz H. M., (2014). Fundamentals of Fingerprint Analysis. NY, CRC Press.
4. Das R. (2014). Biometric Technology: Authentication, Bio Cryptography, and Cloud-Based.
5. Nickolls, L.C. (1956). Scientific Investigation of Crime. London, Bulterwest.
6. Kelly J. S. & Lindblom B. S. (2006). Scientific Examination of Questioned Documents. NY, CRC Press.
7. Sharan M.K. (1978). Court Procedure in Ancient India. Abhinav Publications. India

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 40 **University Exam (UE): 60**

Internal Assessment	**Marks**	**External Assessment**	**Marks**
Mid-Semester Test (MST)	20	Term End Exam	60
Teacher Assessment* (TA) and Class Attendance	20		
Total	**40**		**60**

Teacher Assessment* Presentation/Assignment/Quiz/Group-Discussion etc.

SCHOOL OF STUDIES IN FORENISC SCIENCE
VIKRAM UNIVERSITY, UJJAIN (M.P.)

M.Sc. FORENSIC SCIENCE
(2 Year Program)

This Scheme is based on the OR DINANCE -14 (2) PRINCIPLE (13/05/2025), of M.P Higher education ministry and UGC guidelines of NEP 2020

Theory Paper: Scheme B-1 for Two-year PG program			
Program	**Class: M.Sc. II semester**	**Year: 2025**	**Session: 2025-26**
Subject: Forensic Science			
1	Course Code	FSC-PC- 22	
2	Course Title	Dactylography, Biometrics and Questioned Documents: Practical	
3	Course Type		
4	Pre-Requisite (if any)		
5	Course Learning Outcome (CLO)	Understanding about Collection, Preservation, Handling & Forwarding of Charred Document, Comparison of Forged and Genuine Document, Examination of ink by TLC and Collection and Handling of Digital Evidence.	
6	Credit Value	4	
7	Total Marks	**Max. Marks: 100**	**Minimum Passing Marks: 40**

Total No. Of Lectures-Tutorial-Practical (in hours per week): L-T-P:

Topics	No. of Lectures
1. To Record a Fingerprint Chart by Direct Print Method and Rolling Method. 2. To Identify the Fingerprint Patterns along with Core and Delta. 3. To Perform Ridge Tracing and Ridge Counting of the Fingerprints. 4. Development of Latent Prints by Powder Method and Chemical Methods on Porous and Non-Porous Surfaces. 5. Lifting of Fingerprints by Different Methods. 6. Identification of Chance Prints Found on Different Surfaces. 7. Collection, Preservation, Handling & Forwarding of Charred Document. 8. Photographic Comparison of Handwriting & Signature. 9. Comparison of Forged and Genuine Document by VSC & Other Methods. 10. Decipher of Secret Writing by Physical and Chemical Methods. 11. Examination of Questioned Document & Currency by VSC. 12. Examination of ink by TLC.	

This Scheme is based on the OR DINANCE -14 (2) PRINCIPLE (13/05/2025), of M.P Higher education ministry and UGC guidelines of NEP 2020

Keywords/Tags: Evidence Investigation, Scene of Crime, Sketching, Searching

1. Ahuja R. (2001). Criminology. India, Rawat Pub.
2. Aitken C.G.G. & Stoney, D.A. (1991). The Use of Statistics in Forensic Science. England,Ellis Harwood Limited.
3. Bowen R.T. (2016). Ethics and the Practice of Forensic Science. USA, CRC Press.
4. Burke R.H. (2013). An Introduction to Criminological Theory, 4th ed., UK, Routledge-Taylor & Francis Group.
5. Horswell J. (2016). The Practice of Crime Scene Investigation. USA, CRC Press.
6. Indian Penal Code, Criminal Procedure Code, Indian Evidence Act.
7. James, S.H., and Nordby, J.J. (2003). Forensic Science: An Introduction to Scientific and Investigative Techniques. USA, CRC Press.
8. James S.H. (2014). Forensic Science: An Introduction to Scientific and Investigative Techniques. UK,Taylor& Francis.
9. Nordby J. (1999). Dead Reckoning-The Art of Forensic Science Detection. USA, CRC Press.
10. O'Hara & Osterberg, (1949). An Introduction to Criminalistics. New York, The Macmillan Company.

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 40 University Exam (UE): 60

Internal Assessment	Marks	External Assessment	Marks
Internal Test, Teacher Assessment* (TA) and Class Attendance	40	Term End Exam	60
Total	**40**		**60**

Teacher Assessment* Demonstration/Viva-Voce/Lab record etc.

SCHOOL OF STUDIES IN FORENISC SCIENCE
VIKRAM UNIVERSITY, UJJAIN (M.P.)

M.Sc. FORENSIC SCIENCE
(2 Year Program)

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Value Added Course [Constitutional Human and Moral Values (CHM)/Employability and Entrepreneurship Skill Course (EESC)] (2 Credits)

Suggested Continuous Evaluation Methods:
Maximum Marks: 100

- **CHM: Only Term End Exam (Theory)**
- **EESC: Only Term End Exam (Theory)**

SCHOOL OF STUDIES IN FORENISC SCIENCE
VIKRAM UNIVERSITY, UJJAIN (M.P.)

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w.e.f. Session 2025–2026

Credit Distribution Overview

SEMESTER – III (CREDITS 22)

S. No.	Paper code	Course Component and Name of paper	Credit			Marks		Total Marks
			T	P	Total	Max. Int.	Max. Ext.	
1.	FSC-CC- 31	Forensic Biology, Serology, DNA and Forensic Medicine: Theory	6	-	10	40	60	100
2.	FSC-PC- 31	Forensic Biology, Serology, DNA and Forensic Medicine: Practical	-	4		40	60	100
3.	FSC-CC- 32	Forensic Chemistry Toxicology and Pharmacology: Theory	6	-	10	40	60	100
4.	FSC-PC- 32	Forensic Chemistry Toxicology and Pharmacology: Practical	-	4		40	60	100
5.		Seminar	2	-	2	40	60	100
		Total Credits and Marks			22			500

**Abbreviations Used- Core (Major), Minor, MD: Multi/Inter-Disciplinary, AEC: Ability Enhancement, SEC: Skill Enhancement, DSE: Discipline Specific Elective, VOC: Vocational Course, VAC: Value Added Course.*

SCHOOL OF STUDIES IN FORENISC SCIENCE
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M.Sc. FORENSIC SCIENCE
(2 Year Program)

This Scheme is based on the OR DINANCE -14 (2) PRINCIPLE (13/05/2025), of M.P Higher education ministry and UGC guidelines of NEP 2020

Theory Paper: Scheme B-1 for Two-year PG program			
Program	Class: M.Sc. III semester	Year: 2025	Session: 2025-26
Subject: Forensic Science			
1	Course Code	FSC-CC- 31	
2	Course Title	Forensic Biology, Serology, DNA and Forensic Medicine: Theory	
3	Course Type		
4	Pre-Requisite (if any)		
5	Course Learning Outcome (CLO)	To understanding of the nature and importance of cells in the human body and different biological materials and their examination also importance of autopsy, knowledge on different types of injury and wound, the different techniques of facial reconstruction and their forensic importance, importance of forensic Medicine.	
6	Credit Value	6	
7	Total Marks	**Max. Marks: 100**	**Minimum Passing Marks: 40**

Total No. Of Lectures-Tutorial-Practical (in hours per week): L-T-P:

Unit	Topics	No. Of Lectures
I	Definition, Meaning, and History of Histology. Cell: Definition, Theories, Classification and Significance of Cells in Forensic Science. Cell Organelles and their Functions, Difference between Eukaryotic and Prokaryotic Cell, Difference between Plant and Animal Cell. Cell Division: Definition, Types, Difference between Somatic, Germinal Cell, Totipotency and Apoptosis. Basic Concept in Brief for Anatomy and Physiology of Digestive, Respiratory, Circulatory, Skeleton, Nervous, Excretory, and Reproductive System, etc. Definition, Classification, General Properties of amin acids, proteins and carbohydrates.	14
II	History, Biochemistry and Genetics of ABO, Rh, Mn, and other Systems, Methods of ABO Blood Grouping (Absorption-Inhibition, Mixed Agglutination, And Absorption Elution) from Blood Stains and other Body Fluids/Stains, Determination of Secretor/Non-Secretor Status, Lewis Antigen, Bombay. Blood Spatter Pattern Identification, Identification of Menstrual and Other Stains by Various Methods. Semen: Composition, Structure of Spermatozoa, Forensic Methods of Detection and Identification of Semen and Seminal Stain. Origin of Species: Determination of Human and Animal Origin from Bones, Hair, Flesh,	22

	Nails, Skin, Teeth, Body Tissue, Fluids/Stains viz. Blood, Menstrual Blood, Semen, Saliva, Sweat, Tear, Pus, Vomit, etc., Through Immuno-Diffusion and Immuno-Electrophoresis, Cross Reactivity among Closely Related Species. Immunology: Immune System, Immune Response, Epitopes, Paratopes, Haptens and Adjuvant, Antigens and Antibodies, Antigen-Antibody Reaction.	
III	Mendel Ion Genetics, Genotypes, Phenotypes, Mutation, Multiple Alleles. Biochemical Markers of Individuality: General Understanding, Classification of Markers, Biochemical Basis of Genetic Variation. Structure of DNA, Damage to DNA, Variation in DNA, DNA as Excellent Polymorphic Marker, and Sources of DNA as Forensic Evidence. Different Extraction Techniques of DNA, Basic DNA Typing Techniques; RFLP, PCR, Electrophoresis, and Detection Methods. Polymorphic Enzymes Typing- PGM, ESD, EAP, AK, etc., and their Forensic Significance, HLA Typing, Role of Serogenetic Markers in Individualization, Paternity Disputes, etc.	18
IV	Definition, Developmental History, Brief knowledge about legal procedures in courts, inquests, criminalcourts and their powers, subpoenas, and oaths medical experts. Recording of Medical Experts'Evidence in Courts. Types of Medical Evidence, Kinds of Witness, and Rules for Giving Evidence.Definition and Importance of Personal Identification. Parameters Contributing to Personal Identity-Race, Sex, Age, Complexion, Features &Photographs, Anthropometric measurements etc.	18
V	Thanatology: Definition, Meaning, Death, Type of Death, Concept of Death, Modes of Death and theirCauses and Sign (Immediate Changes, Early Changes, Late Changes) and Symptoms, Manner of Death,Cause of Death, Asphyxia Death, Suspended Animation and Medico LegalImportance of Death.Autopsy: Definition, Classification, Concepts, Objectives, Legal Formalities for Autopsy, AutopsyProcedure, Skin Incisions, etc. Post-Mortem Examination: Importance, Post-Mortem Report Format, External & Internal Examination in Brief. Viscera & Its Preservation. Examination of Asphyxia Death, Examination of Decomposed and Mutilated Bodies. Precautions to be taken during Post MortemExamination. Injuries: Definition, classification, Mechanical Injuries (Abrasion, Contusion, Laceration, Fracture andDislocation of Bone/ Teeth, Incised Wounds, Chop Wound, Stab Wounds and Firearm Wounds), Regional Injuries, Thermal Injuries (Injuries due to Cold and Heat), Chemical Injuries, MiscellaneousInjuries.Medico-Legal Aspects, Post Mortem& Ante Mortem Wounds, General Characteristics ofInjuries from Burns, Scalds, Lightning, Electricity and Radiation. Ancient legal medicine practices: Injury classification; Abhighata, Vrana, Chinna, Bhinna, etc. Cause and manner of death analysis (Marma points, vital organ injuries).	18
	Keywords/Tags: DNA, Injuries, Genetics, Post Mortem	

SCHOOL OF STUDIES IN FORENISC SCIENCE
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TextBooks, ReferenceBooks,Other Resources
Suggested Readings: 1. Albert S., Bray B. Lewis D, Roberts K. & Watson J.D. (1989). Molecular Biology of Cell. New York, Garland Pub. 2. Ball S., (1991). Environmental Law - The Law and Policy relating to Protection of Environment. India, Universal Law Pub Co, Delhi. 3. Biology Methods Manual (1978). London, Metropolitan Police Forensic Science Laboratory Pub. 4. Catts E.P. & Haskell N.H. (1990). Entomology and Death: A Procedural Guide. London, Joyce's Print Shop. 5. Clifford &B.J.(1971). The Examination and Typing of Bloodstains in the Crime Laboratory. USA, US Court Printing Press. 6. Edwin & Caney H. M. (1993). Human Genetics: The Molecular Revolution. London, Jones & Bartlett Pub. 7. Gardner E.J., Simmons M. I. &SnustadD.P.(1991). Principles of Genetics. New York, John Wiley. 8. Jason P. J. & Simpson K. (2014).Simpson's Forensic Medicine, NY, CRC Press. 9. Mallet X. (2014). Advances in Forensic Human Identification. NY, CRC Press. 10. Modi J.S. (2011). Medical Jurisprudence and Toxicology, India, Law Publishers. 11. Molina D. K., & M.D. (2009). Handbook of Forensic Toxicology for Medical Examiners. USA,CRC Press.

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 40 **University Exam (UE): 60**

Internal Assessment	**Marks**	**External Assessment**	**Marks**
Mid-Semester Test (MST)	20	Term End Exam	60
Teacher Assessment* (TA) and Class attendance	20		
Total	**40**		**60**

Teacher Assessment* Presentation/Assignment/Quiz/Group-Discussion etc.

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This Scheme is based on the OR DINANCE -14 (2) PRINCIPLE (13/05/2025), of M.P Higher education ministry and UGC guidelines of NEP 2020

Theory Paper: Scheme B-1 for Two-year PG program			
Program	Class: M.Sc. III semester	Year: 2025	Session: 2025-26
Subject: Forensic Science			
1	Course Code	FSC-PC- 31	
2	Course Title	Forensic Biology, Serology, DNA and Forensic Medicine: Practical	
3	Course Type		
4	Pre-Requisite (if any)		
5	Course Learning Outcome (CLO)	Understanding about Blood/ blood group examination, origin of species by hair samples, identification of fibres by physical and chemical methods, microscopic examination of pollen and diatoms.	
6	Credit Value	4	
7	Total Marks	**Max. Marks: 100**	**Minimum Passing Marks: 40**
Total No. Of Lectures-Tutorial-Practical (in hours per week): L-T-P:			

Topics	No. of Lectures
1. Primary and Confirmatory Examination of Blood/ Semen Samples. 2. Microscopic Examination of Seminal Stains for the Detection of Spermatozoa. 3. Identification of Species from the Hair Sample. 4. Examination of Fiber by Physical and Chemical Methods. 5. Determination of species from Blood Samples. 6. Detection & Examination of Salivary Stains. 7. Draw and label the bones of the human body. 8. Determination of Age and Sex of a Person from Long Bones. 9. Determination of Age and Sex of a Person from Skull. 10. Recording of Bite Marks by Casting& their Photography. 11 Collection and Identification of Pollen Grains, Diatoms of Forensic Importance. 12. Examination of Lip Prints.	
Keyword/Tag: DNA, Injuries, Genetics, Post-Mortem	

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TextBooks, ReferenceBooks,Other Resources
Suggested Readings: 1. Albert S., Bray B. Lewis D, Roberts K. & Watson J.D. (1989). Molecular Biology of Cell. New York, Garland Pub. 2. Ball S., (1991). Environmental Law - The Law and Policy relating to Protection of Environment. India, Universal Law Pub Co, Delhi. 3. Biology Methods Manual (1978). London, Metropolitan Police Forensic Science Laboratory Pub. 4. Catts E.P. & Haskell N.H. (1990). Entomology and Death: A Procedural Guide. London, Joyce's Print Shop. 5. Clifford &B.J.(1971). The Examination and Typing of Bloodstains in the Crime Laboratory. USA, US Court Printing Press. 6. Edwin & Caney H. M. (1993). Human Genetics: The Molecular Revolution. London, Jones & Bartlett Pub. 7. Gardner E.J., Simmons M. I. &SnustadD.P. (1991). Principles of Genetics. New York, John Wiley. 8. Jason P. J. & Simpson K. (2014). Simpson's Forensic Medicine, NY, CRC Press. 9. Mallet X. (2014). Advances in Forensic Human Identification. NY, CRC Press. 10. Modi J.S. (2011). Medical Jurisprudence and Toxicology, India, Law Publishers. 11. Molina D. K., & M.D. (2009). Handbook of Forensic Toxicology for Medical Examiners. USA,CRC Press.

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 40 University Exam (UE): 60

Internal Assessment	Marks	External Assessment	Marks
Internal Test, Teacher Assessment* (TA) and Class Attendance	40	Term End Exam	60
Total	**40**		**60**

Teacher Assessment* Demonstration/Viva-Voce/Lab record etc.

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Theory Paper: Scheme B-1 for Two-year PG program			
Program	**Class: M.Sc. III semester**	**Year: 2025**	**Session: 2025-26**
Subject: Forensic Science			
1	Course Code	**FSC-CC- 32**	
2	Course Title	Forensic Chemistry Toxicology and Pharmacology: Theory	
3	Course Type		
4	Pre-Requisite (if any)		
5	Course Learning Outcome (CLO)	To understanding of the nature and importance of cells in the human body and different biological materials and their examination also importance of autopsy, knowledge on different types of injury and wound, the different techniques of facial reconstruction and their forensic importance, importance of forensic Medicine.	
6	Credit Value	6	
7	Total Marks	**Max. Marks: 100**	**Minimum Passing Marks: 40**

Total No. Of Lectures-Tutorial-Practical (in hours per week): L-T-P:

Unit	Topics	No. Of Lectures
I	Introduction, Concept, and Significance. Poisons: Definition, Classification of Poisons, Types of Poisoning, Mode of Action, Factors Modifying the Action of Poisons, Toxicological Exhibits in Fatal and Survival Cases, Their Preservation, Treatment in Cases of Poisoning, Analysis Report. General Study and Analysis14 Alkaloids: Definition, Classification, Isolation and General Characterization. Vegetable Poison: General Studies and Analysis of Some Vegetable Poisons, Opium, Abrus, cyanogenetic Glycosides, Dhatura, Marking Nuts, Nux-Vomica, Oleander Aconite, etc. Ancient classification of Poison: Sthavara (plant-based), Jangama (animal based), Krtrima (artificial/compound poisons) Traditional detoxification and antidotes: Agada (antidote formulations) Vamana (emesis), Virechana (purgation), Swedana (sweating) therapeutic detox protocols	14
II	Extraction, Isolation and Clean-Up Procedures- Extraction of Non-Volatile Organic Poison, Stas-Otto, Dovbriey Nickolls(Ammonium Sulphate) Method, Acid Digest and Valov (Tungstate) Methods, Solid Phase Micro-Extraction Techniques, Solvent Extraction Methods. Volatile Poisons: Industrial Solvent	22

	Acid and Basic Distillation. Toxic Cations: Dry Ashing and Wet Digestion Process. Toxic Anions: Dialysis Method, Total Alcoholic Extract.	
III	Barbiturates, Methaqualone, Hydromorphine, Methadone, Meprobamate, Mescaline, Amphetamines, LDS, Heroin, Cannabinoids, Phinothiazines. Insecticides: Types, General Methods for their Analysis. III Metallic Poisons: Arsenic, Mercury, Lead, Bismuth, Copper, Aluminium, Iron, Barium, Zinc, Snake Venoms and Other Animal Poisons, Irrespirable Gases, etc. Pharmacological Studies: Absorption, Distribution, Metabolism, Pathways of Drug Metabolism. Pharmacodynamics: Introduction, Nature & Scope.	18
IV	Forensic Chemistry and its Scope, Analysis of Beverages: Alcohol and Non-Alcoholic, Country Made Liquor etc. Adulterated food material. Drugs of Abuse: Introduction, Classification, Narcotic Drugs & Psychotropic Substances, Sampling, Specific Drug types (Cannabis, Heroin, Cocaine, Amphetamine), Drugs of Abuse in Sports. Brief Introduction to Drugs and Cosmetic Act, Excise Act, NDPS Act. An Overview of Clandestine Laboratories. Recent Advancement in Drugs: Rave Drugs, Drug Designing, Doping, Drug Discovery Program, Structural Modification in Drugs, and Drug Monitoring Agencies.	18
V	Examination of Petroleum Products: Distillation &Fractionation, Various Fractions and their Commercial Uses. Standard Methods of Analysis of Petroleum Products for Adulteration. Trap Cases: Purpose, Examination of Chemicals Used in Trap Case. Classification of explosives and their Examination. Examination of Building Materials: Types of Cement and their Composition, Determination of Adulterants by Physical, Chemical and Instrumental Methods, Examination of Brick, Analysis of Cement Mortar and Concrete, Analysis of Gold and Other Metals in Cheating Cases.	18
	Keywords/Tags: Toxicology, Poison, Drug, Examination	

Te tbooks, Reference Books, Other Resources

Su gested Readings:

1. Aggrawal A. (2016). Textbook of Forensic Medicine and Toxicology. India, Avichal Publishing Company.
2. Bardale R. (2011). Principles of Forensic Medicine & toxicology. India, Jaypee Brothers Medical Publishers (P) Ltd.
3. 3. Krishan V. (2014). Textbook of Forensic Medicine & Toxicology: Principles & Practice.UK, Elsevier Health Sciences.
4. 4. Modi J.S. (2011). Medical jurisprudence and Toxicology. India, Law Publishers.8. Jason P. J. & Simpson K. (2014). Simpson's Forensic Medicine, NY, CRC Press.
5. 5.Chatwal and Anand. (2016). Instrumental Methods of Chemical Analysis. India, Himalaya Publishing House Pvt. Ltd.
6. 6. Churáček J. (1993). Advanced Instrumental Methods of Chemical Analysis. Michigan, E. Harwood,
7. 7. Dean J. A. (1995). Analytical Chemistry Handbook. USA, McGraw Hill Inc

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Suggested Continuous Evaluation Methods: **Maximum Marks: 100** **Continuous Comprehensive Evaluation (CCE): 40**		**University Exam (UE): 60**	
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Mid-Semester Test (MST)	20	Term End Exam	60
Teacher Assessment* (TA) and Class attendance	20		
Total	**40**		**60**

Teacher Assessment* Presentation/Assignment/Quiz/Group-Discussion etc.

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Program: Practical Paper: SchemeB-1 for Two Year PG Program			
Subject: Forensic Science	**Class: M.Sc. III semester**	**Year: 2025**	**Session: 2025-26**
1	Course Code	**FSC-PC-32**	
2	Course Title	Forensic Chemistry Toxicology and Pharmacology: Practical	
3	Course Type		
4	Pre-Requisite (if any)		
5	Course Learning Outcome (CLO)	Understanding about different Vegetable Poisons, Extraction Identification of Insecticides and and Pesticides, Identification of Drugs/ Toxicants, Identification of Metallic Poisons from Viscera.	
6	Credit Value	4	
7	Total Marks	**Max. Marks: 100**	**Minimum Passing Marks: 40**

Total No. Of Lectures-Tutorial-Practical (in hours per week): L-T-P:

Topic	No. of Lectures
1. Identification of Common Plants i.e., Calotropis, Cannabis, Dhatura, Nux-Vomica, Marking Nut, Abrus precatorius, Opium Poppy etc. by physical Examination and Color Test. 2. Identification of Different Vegetable Poisons by Thin Layer Chromatography etc. 3. Extraction and Identification of Insecticides and Pesticides by Colour Test/TLC. 4. Extraction and Identification of Drugs/ Toxicants from Biological Matrix and their Detection. 5. Identification of Salts and Metals by Simple Color Test in Case of Metallic Poisoning. 6. Extraction and Identification of Metallic Poisons from Viscera Using Dry Ashing Method Followed by Reinsch's Test. 7.Preliminary & Confirmatory Examination of Chemicals Used in Trap Cases. 8.Preliminary & Confirmatory Examination of the Chemicals Seized in Case of Acid Attack	

9. Estimation Analysis of Petroleum Products using different methods like Density, Viscosity, etc. 10. Detection of Adulterants in Cement Samples. 11. Determination of Percentage of Proof Sprit of Ethyl Alcohol in Illicit Liquor by UV-VIS Spectrophotometry. 12. Separation and Identification of Volatile Liquid by Simple Distillation. 13. Preliminary Examination Black Powder.	
Keyword/Tags: Toxicology, Poison, Drug, Examination	

Text Books, ReferenceBooks, Other Resources

Suggested Readings:

1. Aggrawal A. (2016). Textbook of Forensic Medicine and Toxicology. India, Avichal Publishing Company.
2. Burdale R. (2011). Principles of Forensic Medicine & toxicology. India, Jaypee Brothers Medical Publishers (P) Ltd.
3. Krishan V. (2014).Textbook of Forensic Medicine & Toxicology: Principles & Practice. UK, Elsevier Health Sciences.
4. Modi J.S. (2011).Medical jurisprudence and Toxicology. India, Law Publishers.
5. Khandpur R.S. (2004). Handbook of Analytical Instruments. USA, Tata McGraw Hill Pub. Co.
6. Khanna D.R. &Gulati H.R. (2002). Fundamentals of Optics Geometrical Physical & Quantum. India, R. Chand & Co.
7. Pavania V.B. (2004). Spectroscopy. India, Campus Books International.
8. Robinson J.W. (1996). Atomic Spectroscopy, Revised & Expanded. NY, Marcel Dekkar, Inc.

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 40 University Exam (UE): 60

Internal Assessment	**Marks**	**External Assessment**	**Marks**
Internal Test, Teacher Assessment* (TA) and Class Attendance	40	Term End Exam	60
Total	**40**		**60**

Teacher Assessment* Demonstration/Viva-Voce/Lab record etc.

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Seminar (2 Credits)

Theory Paper: Scheme B-1 for Two-year PG program			
Program	Class: M.Sc. III semester	Year: 2025	Session: 2025-26
Suggested Continuous Evaluation Methods:			
Maximum Marks: 100 • Seminar: Internal Evaluation only			

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w.e.f. Session 2025–2026

Credit Distribution Overview

SEMESTER – IV (CREDITS 22)

S. No.	Paper code	Course Component and Name of paper	Course Type	Credit	Marks		
					Internal Examination Marks (40%)	University Examination Marks (60%)	Total Marks
1.	FSC-CC-41	Research Thesis/ Project/ Patent	Core	22	200	300	500
		Grand Total		22			500