



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

NAAC 'A' Grade (10-01-2023 To 09-01-2028)

NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

M.Sc. Forensic Science SEM I

Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSC	P2S01NCFSC01	General Forensic Science	4-0-1	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Explain the fundamental principles, history, and development of forensic science and its role in the criminal justice system.

CLO2: Apply standard procedures for crime scene management, including documentation, collection, preservation, packaging, and forwarding of physical evidence.

CLO3: Analyse criminal behaviour and evaluate the application of forensic psychology and modern investigative techniques in criminal investigations.

CLO4: Demonstrate the use of forensic photography and digital imaging techniques for accurate documentation of crime scenes and forensic evidence.

CLO5: Interpret forensic findings and communicate scientific evidence effectively to support criminal investigations and judicial proceedings.

Unit	Course Content	Learning Pedagogies	CO(s)
I	History Basic principles and significance Forensic Science, History and Development of Forensic Science, Organizational structures of Forensic Science Laboratories/institutions. Structure of Police, Police and Forensic Scientist relationship with reference to Crime Investigation, Modus Operandi Bureau and its role in Crime Record. Prosecution and Judicial Organization	Classroom Lectures Seminars Problem-Based Learning Self-Directed Learning ICT-Enabled Learning (Digital Resources)	CLO1, CLO2
II	Crime Scene Management: Definition & Causation of Crime Scene, Types of Crime scene, Protection and Recording of Crime scene, Search of Physical Evidences, Preservation, Packing and Forwarding of Physical Evidences, Processing of Crime scene, Blood spattering/Pattern analysis. Criminal: Chance Criminal, Sociology Criminal, Recidivism & Criminal Behaviour.	Classroom Lectures Experiential learning Problem-Based Learning Self-Directed Learning ICT-Enabled Learning (Digital Resources)	CLO2, CLO3



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III	Forensic Psychology and Investigative Techniques: Forensic Psychiatry (insanity), Criminal Profiling, Polygraph (Lie-Detector), Narco analysis, Brain Fingerprinting, Voice Stress Analysis and Speaker Profiling, Forensic Hypnosis.	Classroom Lectures Seminars Problem-Based Learning Self-Directed Learning ICT-Enabled Learning (Digital Resources)	CLO4
IV	Forensic Photography: Basic Principles and Techniques of Black and White and Color Photography, Camera and Lenses, Exposing, Development and Printing, Different types of Developers and Fixers, Modern Development in Photography, Linkage of Cameras and Film Negative, Digital Photography, Digital Water Marking and Digital Imaging, Photogrammetry, Videography, Crime Scene and Laboratory Photography, IR, UV, Photography, Radiography, Portrait Photography, Photomicrography and Microphotography.	Classroom Lectures Experiential learning Problem-Based Learning Self-Directed Learning ICT-Enabled Learning (Digital Resources)	CLO5

Assessment Methodologies/Tools

(A) Internal Assessment

(a) Formative assessment(30Marks)

- Quiz
- Assignment, Self-learning, and Term work
- Seminar/Presentation
- Regularity

(b) Summative Assessment (20Marks)

(c)

- MidTermExamination:20Marks

(B) External Assessment

- TermEndExamination:50Marks



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• Weight age of Learning Efforts for Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weight age(Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Analyse & above (A)	
I	CLO1 CLO2	30	1	1	11	13
II	CLO2 CLO3	32	0	1	11	12
III	CLO4	28	0	1	11	12
IV	CLO5	30	1	1	11	13
		120	2	4	44	50

• Assessment and Evaluation

Sr. No.	Assessment/Evaluation	Component	Weight age (%)
1	Continuous Internal Evaluation	Seminars, Assignments, Quizzes, Class Regularity,	50
2	End-Semester Examination	Written Exam/Practical Exam Project Evaluation (Report, Presentation, Viva)	50

• CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO 1	3	2	2	3	3	1	-	3	2	1
CLO 2	3	2	2	3	3	1	-	3	2	1
CLO 3	3	2	2	3	3	1	-	3	2	1
CLO 4	3	1	3	1	-	-	-	2	1	2
CLO 5	3	2	1	-	1	-	-	1	1	1

Values to the CLO-PLO matrix are assigned by **judging the importance of the particular CLO** in relation to the **PLOs**.

CLO-PLO correlation	Value
Strong	3
Moderate	2
Low	1
No correlation	-

• Suggested Learning Materials Books:

Sr.No.	Title	Author(s)	Publisher
1	Crime Scene Management	M. S. Dahiya.	Shanti prakashan
2	Forensic Science in Criminal investigation	B. R. Sharma.	Universal law pub.
3	Parikh's Textbook of Medical Jurisprudence Forensic Medicine	C. K. Parikh.	CBC pub.
4	Crime Scene Photography	Robinson, Edward	Elsevier
5	Crime science management	Rao, M S	Selective & sci. books



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- **Online Resources (Open Source)**

Sr. No.	Description of Resource(s)	Web link
1	NPTEL lectures of forensic science	https://nptel.ac.in/
2	SWAYAM online courses of forensic science	https://swayam.gov.in/
3	National Digital Library of India(NDLI) e-books and lecture notes	https://ndl.iitkgp.ac.in/



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Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSC	P2S01NCFSC02	Computer Forensic	4-0-1	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Explain the organization and functioning of computer systems, including CPU, memory, operating systems, software, and programming languages.

CLO2: Describe the concepts of computer networks, network topologies, LAN, MAN, WAN, and the OSI and TCP/IP reference models.

CLO3: Apply the principles of cryptography, authentication, digital signatures, and firewall technologies to achieve secure communication.

CLO4: Analyze computer security concepts, security attacks, services, mechanisms, and Network security models to identify potential vulnerabilities.

CLO5: Evaluate various forms of cybercrime, common cyber threats, and the legal framework of the Indian Information Technology Act, 2000, to recommend appropriate cyber security practices.

Unit	Course Content	Learning Pedagogies*	CO(s)
I	Basic Computer Organization: Input Unit, Output Unit, Storage Unit, Central Processing Unit (CPU), Control Unit, Arithmetic & Logic Unit (ALU), instruction set, registers Main Memory- Storage evaluation criteria, Main Memory Organization, Main Memory capacity, RAM-ROM, PROM, EPROM, cache memory, Introduction to Operating System –definition, function Some popular operating system: DOS, UNIX, Microsoft WINDOWS, Microsoft WINDO WSNT, Linux. Computer software: definition, types of software Computer language: machine level ,assembly, high-level language	Classroom Lectures, Seminars, Problem-Based Learning, Self-Directed Learning ICT-Enabled Learning (Digital Resources)	CLO1, CLO2
II	Computer networks: definition, advantages Classification of computer networks: Broadcasting, Point-To-Point networks Categories of computer network: Local Area Networks (LANs), Metropolitan Area Networks (MANs), Wide Area Networks (WANs) The OSI Reference model Diagram, Layers explanation (list only responsibilities of layers with single line explanation) Examples of protocols for different layers of the OSI & TCP/IP model (Only figure No. 2.16 TCP/IP Protocol SUIT-No explanation) Categories of LAN Topologies: Bus, Star, Ring, Tree, Complete (Mesh)Introduction to wireless networks.	Classroom Lectures, Seminars, Problem-Based Learning, Self-Directed Learning ICT-Enabled Learning (Digital Resources)	CLO2, CLO3



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III	Cryptography: Introduction, Two Categories: Symmetric-Key Cryptography, Asymmetric-Key Cryptography, Security Services: Message Confidentiality, Message Authentication, Digital Signature Entity Authentication Firewalls: Packet-Filter Firewall, Proxy Firewall	Classroom Lectures, Seminars, Problem-Based Learning, Self-Directed Learning, ICT-Enabled Learning (Digital Resources)	CLO4 CLO5
IV	Computer Security Concept: Introduction, Security Attacks, Security Services, Security Mechanism a Model for Network Security Cybercrime: Definition and Origins of the World Classification of Cybercrimes, Cybercrime and Indian ITA2000. Introduction to phishing, password cracking, key loggers, spywares, Trojan Horses, DoS / DDoS	Classroom Lectures, Seminars, Problem-Based Learning, Self-Directed Learning, ICT-Enabled Learning (Digital Resources)	CLO5

Assessment Methodologies/Tools

(A) Internal Assessment

(a) Formative assessment(30Marks)

- Quiz
- Assignment, Self-learning, and Term work
- Seminar/Presentation
- Regularity

(b) Summative Assessment (20Marks)

- MidTermExamination:20Marks

(B) External Assessment

- Term EndExamination:50Marks

• Weight age of Learning Efforts for Assessment

Unit	igned COs	Total Learning Hours	Approximate weight age(Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Analyse& above (A)	
I	CLO1 CLO2	30	1	1	11	13
II	CLO2 CLO3	32	0	1	11	12
III	CLO4	28	0	1	11	12
IV	CLO5	30	1	1	11	13
		120	2	4	44	50



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- Assessment and Evaluation

Sr. No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Seminars, Assignments, Quizzes, Class Regularity,	50
2	End-Semester Examination	Written Exam/Practical Exam Project Evaluation (Report, Presentation, Viva)	50

- CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO 1	3	2	2	3	3	1	-	3	2	1
CLO 2	3	2	2	3	3	1	-	3	2	1
CLO 3	3	2	2	3	3	1	-	3	2	1
CLO 4	3	1	3	1	-	-	-	2	1	2
CLO 5	3	2	1	-	1	-	-	1	1	1

Values to the CLO-PLO matrix are assigned by **judging the importance of the particular CLO** in relation to the **PLOs**.

CLO–PLO correlation	Value
Strong	3
Moderate	2
Low	1
No correlation	-

- Suggested Learning Materials Books:

Sr.No.	Title	Author(s)	Publisher
1	Computer fundamentals 4 th Edition	pradeep k. sinha, pritisinha	BPB Publications
2	Introduction to Data Communications and Networking	Behrouz Forouzan	Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 1998, 4 th Edition.
3	Network Security Essentials 4th edition (Applications and Standards)	William Stallings	Pearson Education India,
4	Cyber Security	Nina Godbole ,Sunit Belapure	Wiley India

- Online Resources (Open Source)

Sr.No.	Description of Resource(s)	Web link
1	NPTEL lectures of forensic science	https://nptel.ac.in/
2	SWAYAM online courses of forensic science	https://swayam.gov.in/
3	National Digital Library of India(NDLI) e-books and lecture notes	https://ndl.iitkgp.ac.in/



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M.Sc. Forensic Science SEM I

Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSE	P2S01NCFSC03	Instrumental Methods – Physical	4-0-1	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Explain the fundamental principles of atomic and molecular spectroscopy, including rotational, vibration, electronic, and polyatomic spectra, and correlate spectroscopic Data with molecular structure.

CLO2: Demonstrate the principles, instrumentation, and applications of UV-Visible, IR, fluorescence, phosphorescence, atomic absorption, and atomic emission spectroscopic techniques for qualitative and quantitative analysis.

CLO3: Analyze the working principles, instrumentation, and applications of advanced Spectroscopic techniques such as NMR, X-ray spectroscopy, Raman spectroscopy, and neutron activation analysis for material characterization.

CLO4: Apply thermal analysis techniques, including Differential Scanning Calorimetry (DSC), Differential Thermal Analysis (DTA), and Thermogravimetric Analysis (TGA), to investigate the thermal properties of materials.

CLO5: Evaluate the suitability of different spectroscopic and radiochemical techniques for The identification, characterization, and quantitative analysis of chemical substances in forensic, environmental, pharmaceutical, and industrial applications.

Unit	Course Content	Learning Pedagogies*	CO(s)
I	Atomic and Molecular Spectroscopy Qualitative discussion of Rotational, Vibrational and Electronic Spectra, Spectra of Polyatomic Molecules, IR Spectroscopy-correlation of Infrared Spectra with Molecular Structure, Fourier Transform, Fluorescence, Energy Dispersive X-ray Analysis, Wavelength Dispersive X-Ray Analysis, X-Ray Diffractions, Auger Effect.	Interactive Lectures, Problem-Based Learning, ICT-Enabled Learning, Micro-Projects	CLO1, CLO2
II	UV and Visible Spectroscopy: Types of Sources and Stability, Wavelength selection, Filters cells and Sampling Devices, Detectors, Resolution, Qualities and Quantitative Methods for Detection. Fluorescence and Phosphorescence Spectrophotometry: Types of Sources, Structural factors, Instrumentation, Comparison of Luminescence and UV-VIS Absorption methods. IR Spectrophotometry: Dispersive and Fourier Transform Spectrophotometry, Sample Handling, Quantitative Analysis and Interpretation of IR Spectra.	Interactive Lectures, Tutorial, Industrial Visit, Experiential Learning	CLO2, CLO3



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III	Atomic Absorption Spectrometry: Instrumentation and Techniques, Interference in AAS, Background Correction Methods, Quantitative Analysis. Atomic emission Spectrometry: Instrumentation and Techniques, ICP-AES, Comparison of ICP vs. AAS methods, Quantitative analysis, Application. Nuclear Magnetic Resonance Spectroscopy: Basic Principle, Theory, Instrumentation & Applications.	Interactive Lectures, Tutorial, Industrial Visit, Experiential Learning	CLO4
IV	X-Ray Spectroscopy: Introduction, X-Ray Absorption and Fluorescence methods, X-Ray diffractions, Auger emission spectroscopy (AES), and Electron spectroscopy for Chemical Analysis. Radiochemical Techniques: Basic Principle and Theory, Introduction about Nuclear Reaction and Radiation, Neutron Sources, Neutron Activation Analysis (NAA) Thermal analysis methods: Basic Principle and Theory, Differential Scanning Colorimetry and Differential Thermal Analysis, Thermogravimetry Raman Spectrometry: Instrumentation, Sample Handling and Illumination, Structural Analysis.	Interactive Lectures, Tutorial, Industrial Visit, Experiential Learning	CLO5

Assessment Methodologies/Tools

(A) Internal Assessment

(c) Formative assessment(30Marks)

- Quiz
- Assignment, Self-learning, and Term work
- Seminar/Presentation
- Regularity

(d) Summative Assessment (20Marks)

- MidTermExamination:20Marks

(B) External Assessment

- Term EndExamination:50Marks

• Weight age of Learning Efforts for Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weight age(Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Analyse & above (A)	
I	CLO1 CLO2	30	1	1	11	13
II	CLO2 CLO3	32	0	1	11	12
III	CLO4	28	0	1	11	12
IV	CLO5	30	1	1	11	13
		120	2	4	44	50



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- Assessment and Evaluation

Sr. No.	Assessment/Evaluation	Component	Weight age (%)
1	Continuous Internal Evaluation	Seminars, Assignments, Quizzes, Class Regularity,	50
2	End-Semester Examination	Written Exam/Practical Exam Project Evaluation (Report, Presentation, Viva)	50

- CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO 1	3	2	2	3	3	1	-	3	2	1
CLO 2	3	2	2	3	3	1	-	3	2	1
CLO 3	3	2	2	3	3	1	-	3	2	1
CLO 4	3	1	3	1	-	-	-	2	1	2
CLO 5	3	2	1	-	1	-	-	1	1	1

Values to the CLO-PLO matrix are assigned by **judging the importance of the particular CLO** in relation to the **PLOs**.

CLO–PLO correlation	Value
Strong	3
Moderate	2
Low	1
No correlation	-

- Suggested Learning Materials Books:

Sr.No.	Title	Author(s)	Publisher
1	Instrumental Methods of Chemical Analysis	Gurdeep R. Chatwal	Himalaya Publishing house
2	Biophysical Chemistry: Principles & Techniques	Upadhyay Nath	Himalaya Publishing house
3	Instrumental methods of Analysis	Willard Merritt Dean Settle	CBS Publishers & Distributors and Wadsworth Publishing Co.

- Online Resources (Open Source)

Sr. No.	Description of Resource(s)	Web link
1	NPTEL lectures of forensic science	https://nptel.ac.in/
2	SWAYAM online courses of forensic science	https://swayam.gov.in/
3	National Digital Library of India(NDLI)–e-books and lecture notes	https://ndl.iitkgp.ac.in/



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M.Sc. Forensic Science SEM I

Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSE	P2S01NCFSC04	Instrumental Methods - Biological	2-0-0	60	02

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Explain the principles, instrumentation, and applications of centrifugation techniques, including density gradient, preparative, refrigerated, and ultracentrifugation for biological sample separation.

CLO2: Demonstrate the working principles and applications of optical and advanced Microscopy techniques for the examination and characterization of biological and forensic specimens.

CLO3: Apply immunochemical techniques, including immunodiffusion, immune electrophoresis, ELISA, RIA, fluorescence immunoassay, and biosensors, for the detection and analysis of biological molecules.

CLO4: Describe the principles and methodologies of molecular biology techniques, including nucleic acid isolation, gene cloning, hybridization, probe preparation, and gene Expression analysis.

CLO5: Evaluate the suitability of centrifugation, microscopy, immunochemical, and Molecular biology techniques for qualitative and quantitative analysis in forensic, biomedical, and research applications.

Unit	Course Content	Learning Pedagogies*	CO(s)
I	Centrifugation techniques: Basic principle of sedimentation, Various Types of Centrifuges, Density Gradient Centrifugation, Preparative Centrifugation, Analysis of Sub Cellular Fractionation, Ultra Centrifuge- Refrigerated Centrifuges. Microscopy: Basic Principles, Simple and Compound Microscope, Comparison Microscope, Phase Contrast Microscope, Stereoscopic Microscope, Polarizing Microscope, Fluorescence Microscopy, IR Microscopy, Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM).	Interactive Lectures, Experiential Learning, Collaborative Learning, Experiential Learning	CLO1- CLO5
II	Immuno Chemical Techniques: General principles, Production of Antibodies, Precipitin Reaction, Gel Immuno diffusion, Immuno- electrophoresis, and Complement fixation, Radio Immuno assay (RIA), ELISA, and Fluorescence Immuno assay, Biosensors Molecular Biology Techniques: outline of general manipulations, Enzyme and in genetic manipulation, Cloning procedure, Isolation of Specific Nucleic acid sequence- complementary DNA, Gene libraries, Colony Hybridization, Nick Translation, Oligo nucleotide Probes, Expression of genes.	Experiential Learning, Research-Oriented Learning, Collaborative Learning, Case-Based Learning	CLO1- CLO5

Assessment Methodologies/Tools



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(A) Internal Assessment

(a) Formative assessment(15Marks)

- Quiz
- Assignment, Self-learning, and Term work
- Seminar/Presentation
- Regularity

(b) Summative Assessment (10Marks)

- MidTerm Examination: 10Marks

(B) External Assessment

- Term End Examination: Marks: 25Marks

Unit	Aligned COs	Total Learning Hours	Approximate weightage (Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Application/ Analyze & above (A)	
I	CLO1-CLO5	30	01	01	10	12
II	CLO1-CLO5	30	01	01	11	13
		60	02	02	21	25

• Assessment Methodologies/Tools

Sr. No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Seminars, Assignments, Quizzes, Class Regularity,	50
2	End-Semester Examination	Written Exam/Practical Exam Project Evaluation (Report, Presentation, Viva)	50

(B) CLOs–PLOs Matrix

CLO	PLO/PSO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PSO1	PSO2
CLO1	3	3	2	2	2	2	2	2	2	2
CLO2	3	2	3	2	2	2	2	2	3	2
CLO3	2	3	2	2	3	2	2	2	3	3
CLO4	3	2	3	2	3	2	3	2	3	2
CLO5	3	3	3	3	3	2	3	2	2	3

Values to the CLO-PLO matrix are assigned by judging the importance of the particular CLO in relation to the PLOs.

CLO–PLO correlation	Value
Strong	3
Moderate	2
Low	1
No correlation	-

- Suggested Learning Materials Books:



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Sr.No.	Title	Author(s)	Publisher
1	Biochemistry	U. Satyanarayan	Elsevier
2	Book of Biotechnology	B. D. Singh	Kalyani Publishers
3	Immunology	P. K.Gupta	Rustogi Publications
4	An Introduction to Microbiology	Pelzer	McGraw Hill Education
5	Physical Chemistry: Principles & Techniques	Upadhyay Nath	Himalaya Publishing house

• Online Resources (Open Source)

Sr. No.	Description of Resource(s)	Web link
1	NPTEL lectures of forensic science	https://nptel.ac.in/
2	SWAYAM online courses of forensic science	https://swayam.gov.in/
3	National Digital Library of India(NDLI)-e-books and lecture notes	https://ndl.iitkgp.ac.in/

Course	Course Code	Course Title	Teaching-	Total	Course
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M.Sc. Forensic Science SEM I

Type			Learning Scheme	Notional Hours	credits
			L-P-T		
DSE	P2S01NCFSC05	Practicals based on General Forensic Science and Computer Forensic	0-8-0	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Perform systematic management of indoor and outdoor crime scenes, including Proper assessment, documentation, and control of the scene environment.

CLO2: Prepare accurate sketches of indoor and outdoor crime scenes to record spatial Relationships and key evidential details.

CLO3: Reconstruct and evaluate three-dimensional crime scenes using appropriate forensic techniques for better understanding of crime dynamics.

CLO4: Apply proper methods for searching, identifying, collecting, packaging, and Preserving physical evidence in accordance with forensic protocols.

CLO5: Demonstrate the fundamental principles and techniques of forensic photography, videography, photogrammetry, and specialized imaging methods such as UV and IR photography.

CLO6: Perform photography and videography of crime scenes to ensure accurate visual documentation of evidence and scene conditions.

CLO7: Analyze physical evidence using UV-Visible Spectrophotometry for detection of drugs or dyes in forensic samples.

CLO8: Examine trace evidence such as paint chips and hair samples using FTIR spectroscopy for material identification and comparison.

CLO9: Operate advanced analytical instruments such as Atomic Absorption Spectroscopy (AAS) for elemental analysis of forensic samples.

CLO10: Integrate multiple forensic techniques to interpret evidence and support scientific conclusions in crime scene investigation and forensic reporting.

	Course Content	Learning Pedagogies*	CO(s)
	1. To perform Crime Scene Management of Indoor crime Scene. 2. To perform sketching of indoor Crime Scene. 3. To perform Crime Scene Management of outdoor crime scene. 4. To perform sketching of outdoor crime scene. 5. To reconstruct & evaluate the 3D crime scene. 6. To perform collection & packaging of physical evidences found at Crime Scene. 7. To perform searching of physical evidence at Crime Scene. 8. To perform fundamental rules for photography. 9. To perform Photography at Crime Scene. 10. To perform Videography of Crime Scene. 11. To perform Photogrammetry of Crime Scene. 12. To perform UV & IR Photography at Crime Scene.	Experiential learning, Problem-Based Learning, Research-Oriented Learning, Collaborative Learning	CLO1-CLO10



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13.	To detect drug or dye using UV-Visible Spectrophotometer.		
14.	To analyze paint chip using FTIR.		
15.	To analyze hair sample using FTIR		
16.	To perform AAS.		

• Weightage of Learning Efforts for Assessment

Subjects	Aligned CLOs	Total Learning Hours	Approximate weightage (Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Application/ Analyze & above (A)	
Practical -1	CLO1 – CLO10	120	03	03	44	50
		120	03	03	44	50

• Assessment Methodologies/Tools

(A) Internal Assessment

(a) Formative assessment(20Marks)

- Method of Working
- Viva
- Regularity
- Journal Writing

(b) Summative Assessment (30Marks)

- MidTermPracticalExamination:30Marks

(B) External Assessment

- TermEndPracticalExamination:50Marks

• Assessment and Evaluation

Sr.No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Journal/record book, oral quiz, Periodic tests, Laboratory Regularity	50
2	End-Semester Examination	Practical Exam/Project Evaluation (Report, Presentation, Viva)	50

• CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1	3	2	3	1	1	1	2	2	1	1
CLO2	3	1	3	1	1	1	1	2	2	1
CLO3	2	3	2	1	2	1	2	2	1	1
CLO4	2	2	3	1	1	2	1	2	2	2
CLO5	2	2	3	1	2	1	1	3	1	1
CLO6	3	3	2	1	1	2	1	2	1	1
CLO7	3	3	2	1	1	1	1	2	2	2
CLO8	2	3	2	2	2	2	1	3	2	1
CLO9	2	3	2	1	1	1	1	2	1	1
CLO10	1	2	1	3	2	2	3	2	3	2



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

NAAC 'A' Grade (10-01-2023 To 09-01-2028)

NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

M.Sc. Forensic Science SEM I

Values to the CLO-PLO matrix are assigned by judging the importance of the particular CLO in relation to the PLOs.

CLO-PLO correlation	Value
Strong	3
Moderate	2
Low	1
No correlation	-

- Suggested Learning Materials Books:

Sr. No.	Title	Author(s)	Publisher
1	Crime Scene Investigation	Swanson, Chamelin & Territo	McGraw-Hill Education
2	Instrumental Methods of Chemical Analysis	B.K. Sharma	Krishna Prakashan Media (India)
3	Forensic Science in Criminal Investigation & Trials	B.R. Sharma	Universal Law Publishing (India)

- Online Resources (Open Source)

Sr. No.	Description of Resource(s)	Web link
1	Forensic laboratory procedures of DFSS	https://dfss.nic.in
2	Training handbooks of NFSU	https://nfsu.ac.in



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Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSE	P2S01NCFSC06	Practicals based on Instrumental Methods – Physical and Instrumental Methods – Biological	0-8-0	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Perform pH-metry and conductometry techniques for the analysis of chemical solutions.

CLO2: Apply centrifugation techniques for the separation of biological samples such as Proteins and blood components.

CLO3: Demonstrate the structure, working principles, and applications of simple and Compound microscopes for sample observation.

CLO4: Isolate DNA using electrophoresis techniques and interpret separation results for Biological analysis.

CLO5: Perform Thin Layer Chromatography (TLC) for the analysis and comparison of ink samples.

CLO6: Analyze alcohol samples using Gas Chromatography–Mass Spectrometry (GC-MS) For forensic identification.

CLO7: Examine drugs and dyes using High Performance Liquid Chromatography (HPLC) For qualitative and quantitative analysis.

CLO8: Configure and demonstrate TCP/IP network settings for basic computer communication.

CLO9: Operate internet services using command prompt (CMD) tools for network access and troubleshooting.

CLO10: Integrate chemical, biological, analytical, and computer-based techniques for problem-solving in forensic and scientific investigations.

	Course Content	Learning Pedagogies*	CO(s)
	1. To perform pH metry. 2. To perform Conductometry. 3. To separate protein / blood sample using centrifuge. 4. To study various parts & working of simple & compound microscope. 5. To isolate DNA sample using Electrophoresis. 6. To perform TLC of ink sample. 7. To analyze alcohol by GCMS. 8. To analyze drug/dye by HPLC. 9. To know TCP/IP configuration 10. To work with internet using CMD.	Experiential Learning, Mini Research Task, Research-Oriented Learning, Collaborative Learning	CLO1-CLO10



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Weightage of Learning Efforts for Assessment

Subjects	Aligned CLOs	Total Learning Hours	Approximate weightage(Marks)to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Application/ Analyze & above (A)	
Practical -2	CLO1 – CLO10	120	03	03	44	50
		120	03	03	44	50

Assessment Methodologies/Tools

(A) Internal Assessment

(c) Formative assessment(20Marks)

- Method of Working
- Viva
- Regularity
- Journal Writing

(d) Summative Assessment (30Marks)

- MidTermPracticalExamination:30Marks

(B) External Assessment

- TermEndPracticalExamination:50Marks

Assessment and Evaluation

Sr. No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Journal/record book, oral quiz, Periodic tests, Laboratory Regularity	50
2	End-Semester Examination	Practical Exam/Project Evaluation (Report, Presentation, Viva)	50

CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1	3	2	3	1	1	1	2	2	1	1
CLO2	3	1	3	1	1	1	1	2	2	1
CLO3	2	3	2	1	2	1	2	2	1	1
CLO4	2	2	3	1	1	2	1	2	2	2
CLO5	2	2	3	1	2	1	1	3	1	1
CLO6	3	3	2	1	1	2	1	2	1	1
CLO7	3	3	2	1	1	1	1	2	2	2
CLO8	2	3	2	2	2	2	1	3	2	1
CLO9	2	3	2	1	1	1	1	2	1	1
CLO10	1	2	1	3	2	2	3	2	3	2



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No correlation	-

- Suggested Learning Materials Books:

Sr.No.	Title	Author(s)	Publisher
1	Instrumental methods of Chemical Analysis	Gurdeep R. Chatwa	Himalaya Publishing House (India)
2	A Textbook of Biotechnology	R.C. Dubey	S. Chand Publishing
3	Instrumental Methods of Chemical Analysis	B.K. Sharma	Krishna Prakashan Media (India)
4	Computer Fundamentals	P.K. Sinha & Priti Sinha	BPB Publications (India)

- Online Resources (Open Source)

Sr. No.	Description of Resource(s)	Web link
1	e-PG Pathshala (UGC)	https://epgp.inflibnet.ac.in
2	Forensic laboratory procedures of DFSS	https://dfss.nic.in
3	National Digital Library of India (NDLI)	https://ndl.iitkgp.ac.in