SAGE University Indore

Institute of Sciences

Forensic Science Department

CHOICE BASED CREDIT SYSTEM (NEP-2020)

PROGRAM STRUCTURE

Effective for Academic Session: 2026-27

Program: Bachelor of Science in Forensic Science

Semester: I

Program Code : B Sc [FS]
Admission Batch : 2026-27

Subject wise Distribution of Marks and Corresponding Credits

S. No.	Subject Code	Category	Subject Title	Maximum Marks Allotted							Hours/week						Credits	Credits Hours
				Theory (100 Marks)			Practical/Studio (100 Marks)			Total Marks	L	T	P	Studio/ Field Work/ Assignment	S/M	NTCC		
				End Sem Exam (ESE)	Continuous Internal Evaluation (CIE)		End Sem. Exam (ESE) For Practical and Viva	Continuous Internal Evaluation (CIE)										
					Mid Sem Test (MST)	Attendance/ Quiz /Assig./ Presentations		Lab Work / WPR	Attendance/Assignment /Viva/Lab Manual										
1	SCIMCNFC101T	MC	Introduction to Forensic Science and Criminalistics	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
2	SCIMCNFC101P	MC	Introduction to Forensic Science and Criminalistics	-	-	-	30	10	10	50	0	0	6	-	-	-	3	6
3	SCIMINCH102T/SCIMINPH102T/SCIMINZO102T/SCIMINBO102T	MI	Chemistry I/Physics I/Zoology I/Botany I	60	20	20	-	-	-	100	2	0	0	-	-	-	2	2
4	SCIMINCH102P/SCIMINPH102P/SCIMINZO102P/SCIMINBO102P	MI	Chemistry I/Physics I/Zoology I/Botany I	-	-	-	30	10	10	50	0	0	4	-	-	-	2	4
5	Multidisciplinary	MD	From University List	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
6	SCISENFT104T	SE	Fundamentals of Forensic Lab Techniques	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
7	TRNAENPD001P	AE	Professional Development-I	-	-	-	60	20	20	100	-	-	4	-	-	-	2	4
8	SCIDPNMP105N	DP	Micro Project - I	-	-	-	-	20	30	50	-	-	-	-	-	4	2	4
			TOTAL	**240**	**80**	**80**	**120**	**60**	**70**	**650**	**11**	**0**	**14**	**0**	**0**	**4**	**20**	**29**

Legends		
L= Lecture	1 Hr	1 CR
T= Tutorial	1 Hr	1 CR
P= Practical	2 Hr	1 CR
S= Studio	1 Hr	1.5 CR
N= Non Teaching Credit Course (NTCC)	2 Hr	1 CR
M= MOOC	SWAYAM/NPTEL	Certificate
BM = Blended MOOC	1 Hr	1 CR

NOTE :
Weekly Progress Report (WPR) is for NTCC
Assignment / VIVA for NTCC
Assignment / VIVA / Lab manual for P

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			Department Name: Forensic Science			
Recommended Programs: Bachelor of Science in Forensic Science			Semester: I			
Course Name	Introduction to Forensic Science and Criminalistics		Course Code	SCIMCNFC101T		
Credit Hours	L	T	P	N	Total Credits	3
	3	0	0	-		
Prerequisites (if any)	Basic understanding of science (Physics, Chemistry, Biology) and familiarity with legal systems and criminal justice concepts					
Course Objectives	**The course objectives are as follows-** 1. To understand the basic concepts, scope, principles, and ethical aspects of Forensic Science. 2. To identify different branches of Forensic Physical, Chemical, Biological Sciences, Questioned Documents, and Cyber Forensics. 3. To explain the methods for collection, preservation, and forwarding of different types of evidences. 4. To discuss the structure and functions of Police organizations under Central and State Governments. 5. To relate the role of Forensic Science in crime detection, administration of justice, and legal frameworks.					
Course Content	**Unit 1:** **(05 Hours)** Basic of Forensic Science: Definitions, History & Development of Forensic Science, Scope of Forensic Science, Different branches of Forensic Science, Ethics in Forensic Science, Basic Principles of Forensic Science, Laws of Forensic Science, Role of Forensic expert. **Unit II:** **(15 Hours)** Basic of Forensic Physical and Chemical Sciences: Introduction, definition and scope. Density, refractive index, birefringence; other optical properties of crystalline material. Brief idea on electromagnetic spectrum. General idea of instruments used in forensic physics like microscopy, spectroscopy, densitometer. Nature, collection, preservation & forwarding of physical evidence for scientific examinations. Basic introduction to different branches of Forensic Physical Sciences – Forensic Engineering, Forensic Photography, Crime Scene Reconstruction, Glass Examination, Voice analysis, Road accidents, building material, Nature, collection, preservation & forwarding of physical evidence for scientific examinations Basic of Forensic Chemical Sciences: Introduction to Forensic Chemistry, cases involved in Forensic chemistry, tools and techniques, Nature, collection, preservation & forwarding of chemical evidence for scientific examinations. preliminary and confirmatory methods used in Forensic chemistry. Branches of Forensic Chemical Sciences – Forensic Chemistry, Forensic Toxicology, Narcotic Drugs and Psychotropic Substances, Arson & Explosives, Trap cases.					



	Unit III: **(15 Hours)** Basic of Forensic Biological Sciences: Introduction to Forensic Biology, cases involved in Forensic Biology, Nature, collection, preservation & forwarding of biological evidence for scientific examinations. preliminary and confirmatory methods used in Forensic Biology. Branches of Forensic Biological Sciences – Forensic Serology, Forensic Anthropology, Forensic DNA Fingerprinting, Forensic Odontology, Forensic Microbiology, Forensic Botany, Forensic Entomology, Wildlife Forensics. Basic of Questioned Documents and Cyber Forensic: Introduction and classification of documents, Original and forged document, and holographic document. Preliminary examination of documents, ways of procurement, handling and marking of document. Nature, collection, preservation & forwarding of questioned document evidence for scientific examinations (VSC, ESDA). Basic tools for Forensic document examination. Introduction to Cyber Forensic, Branches of Cyber Forensic, Nature, collection, preservation & forwarding of digital evidence for scientific examinations. **Unit IV:** **(05 Hours)** Crime and Administration of Justice: Meaning, Difference between civil and Criminal Law, Object of Punishment, Punishment and its types, Fundamental Rights, functions of different Courts, Nature, causes and consequences of crime. Deviant behavior. Hate crimes, organized crimes and public disorder, domestic violence and workplace violence. White collar crimes Laws specific to Forensic Science: Bhartiya Nyaya Sanhita: Offences against person: 63, 80, 100,101, 103, 108, 114, 116, 117, 126, 127, 130, 137, 138 Acts Pertaining to Socio-economic and Environmental Crimes. Dowry Prohibition Act, POCSO Act, Wildlife Protection Act, IT Act, NDPS Act, Juvenile Delinquency Act. **Unit V:** **(05 Hours)** Investigative organization under State and central government: General information about their structure and functions of BSF, Assam rifle, CRPF, CISF, ITBP, SSB, RPF, NDRF, NSG. BPR&D, DFSS, NFSU, NCW, NHRC, CID, CBI, IB, RAW, INTERPOL, FBI, NIA, NDTL, CEIB, WADA, NCRB, NCRP, Rehabilitation Centre, NDDTC State Police organization: General organization of police at different level. Police organization at district level. The police and policing Commissioner and system of policing other police department (state): criminal investigating department (CID) State armed police, home guards and women police Forensic science labs and other forensic institutions.
Textbooks	1. Nanda, B.B. and Tiwari, R.K. Forensic Science in India- A Vision for the Twenty First Century. Select Publisher: New Delhi; (2001) 2. Richard Saferstein; "Criminalistics: An Introduction of Forensic Science", 2007, Prentice Hall Inc, USA. 3. Barnett P.D. (2001), Ethics in Forensic Science: Professional Standards for the Practice of Criminalistics, CRC press
References	1.Bennett W.W. and Hass K.M. Criminal Investigation 6 th ed. Wordsworth Thompson Learning: (2001)

SAGE UNIVERSITY-INDORE APPROVED ACADEMIC COUNCIL
Institute of Science SAGE University, Indore
SAGE UNIVERSITY APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	2. Randal Davis; "Evidence Collection and Presentation", 2nd Ed, 2016, Law Tech Publishing Group.
Course Outcomes	**At the conclusion of this course the successful student will be able to-** **CO:1** Define the basic concepts, principles, and ethics of Forensic Science. **CO:2** Explain the scope and applications of Forensic Physical, Chemical, and Biological Sciences. **CO:3** Apply proper methods for collection and preservation of different types of evidences. **CO:4** Analyze the link between crime, punishment, and justice with relevant laws. **CO:5** Describe the structure and functions of central and state police and forensic institutions.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy

CO/ PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Knowledge Levels (K1, K2, ..., K6)
CO1	3	1	-	2	1	3	1	2	1	2	2	2				K1, K2, K3
CO2	3	2	2	2	3	2	1	2	1	2	2	3			2	K2, K3, K4
CO3	2	3	3	2	3	3	1	2	2	2	2	3	3	2	2	K2, K3, K4, K5
CO4	3	2	-	3	1	3	2	2	1	2	2	2				K1, K2, K3
CO5	2	1	-	2	2	2	2	3	2	3	2			2		K2, K3, K4

High-3 Medium-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: I**		
Course Name	**Introduction to Forensic Science and Criminalistics**		**Course Code**	**SCIMCNFC101P**		
Credit Hours	L	T	P	N	**Total Credits**	**3**
	0	0	**6**	-		
Prerequisites (if any)	Basic knowledge of criminal law, evidence types, and fundamentals of forensic science					
Course Objectives	**After studying this paper, the students will know –** 1. To execute proper steps of crime scene investigation and evidence handling in simulated cases. 2. To apply photography, videography, and documentation techniques for accurate crime scene recording. 3. To analyze past criminal cases and assess criminal behavior using profiling and psychological theories. 4. To evaluate organizational structures of police and paramilitary forces in India. 5. To examine socio-legal and environmental factors influencing different types of crimes.					
List of Practicals	1. To execute the steps of crime scene investigation in a simulated case 2. To apply the procedure for efficient photography of crime scene in a simulated case 3. To apply the procedure for efficient videography of crime scene 4. To collect, preserve, pack and forward biological evidence from a simulated crime scene 5. To collect, preserve, pack and forward chemical evidence from a simulated crime scene 6. To collect, preserve, pack and forward documentary evidence from a simulated crime scene 7. To collect, preserve, pack and forward digital evidence from a simulated crime scene 8. To review past criminal cases and elucidate which theory best explains the criminal behavior of the accused. 9. To review crime cases where criminal profiling assisted the police to apprehend the accused. 10. To cite examples of crime cases in which the media acted as a pressure group. 11. To examine a hypothetical case of juvenile delinquency and suggest remedial measures. 12. To evaluate how rising standards of living affect crime rate. 13. To visit a "Police Station" and examine the amenities according to conventional police stations. 14. To review the framework of the organizational structure of Para-military force in India.					

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	15. To compare the organizational set up of police forces in India. 16. To evaluate the hypothetical cases that involves psychological assessment. 17. To examine a hypothetical case of White-collar crime.
Text Books	1. Nanda, B.B. and Tiwari, R.K. Forensic Science in India- A Vision for the Twenty First Century. Select Publisher: New Delhi; (2001) 2. Richard Saferstein; "Criminalistics: An Introduction of Forensic Science", 2007, Prentice Hall Inc, USA. 3. Barnett P.D. (2001), Ethics in Forensic Science: Professional Standards for the Practice of Criminalistics, CRC press
References	1. Bennett W.W. and Hass K.M. Criminal Investigation 6th ed. Words worth Thompson Learning: (2001). 2. Randal Davis; "Evidence Collection and Presentation", 2nd Ed, 2016, Law Tech Publishing Group
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Analyze and document a simulated crime scene. **CO2:** Evaluate techniques for crime scene photography and videography. **CO3:** Assess criminal behavior using profiling and psychological theories. **CO4:** Create solutions for juvenile delinquency and white-collar crimes. **CO5:** Compare and optimize police and paramilitary organizational structures.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Knowledge Levels (K_1, K_2, …, K_6)
CO1	2	3	3	2	3	2	1	2	2	2	3	2		2	2	K3, K4, K5
CO2	2	2	3	2		1	-	3	1	2	3			2	2	K3, K4
CO3	3	2	1	3	1	3	1	2	2	2	3			2	2	K3, K4
CO4	2	2	1	3	1	3	2	2	3	3	3	3			3	K3, K4, K5
CO5	2	2	1	2	2	2	2	3	3	3	3	3	3		3	K3, K4, K5

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

BSc-FS

SAGE UNIVERSITY, INDORE

Institute Name: Institute of Sciences			Department Name: Chemistry			
Recommended Programs: Bachelor of Science in Biotechnology / Forensic Science / CBZ/Microbiology				Semester - I		
Course Name	Chemistry – I		Course Code	SCIMINCH102T		
Credit Hours	L	T	P	N	Total Credits	2
	2	-	-	-		
Pre-requisites (if any)	12th Class level Chemistry.					
Course Objectives	**The course objectives are as follows:** 1. To understand the fundamental concepts of atomic structure, including quantum mechanical models, quantum numbers, and atomic orbitals. 2. To explain chemical bonding and molecular structure using ionic, covalent, VSEPR, Valence Bond (VB), and Molecular Orbital (MO) theories' 3. To develop a strong foundation in organic chemistry basics, including electronic effects, bond cleavage, reactive intermediates, and aromaticity. 4. To analyze stereochemistry of organic compounds, including geometrical and optical isomerism, and apply nomenclature systems such as R/S and E/Z. 5. To understand the preparation, properties, and reactions of aliphatic hydrocarbons using a functional group approach.					
Course Content	**ATOMIC STRACTURE, CHEMICALBONDING & ORGANIC CHEMISTRY-I** **UNIT I: Atomic Structure** Review of: Bohr's theory and its limitations, dual behavior of matter and radiation, de Broglie's relation, Heisenberg Uncertainty principle. Hydrogen atom spectra, Need of a new approach to Atomic structure, Quantum Numbers, Shapes of s, p and d atomic orbitals (6 hours) **UNIT II: Chemical Bonding and Molecular Structure** Ionic Bonding, Covalent bonding: VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonalbipyramidal and octahedral arrangements, MO Approach: MO treatment of mononuclear diatomic molecules of 1st and 2nd periods (including idea of s- p mixing) (6 hours) **UNIT III: Fundamentals of Organic Chemistry** Physical Effects: Electronic Displacements: Inductive Effect, Electromeric Effect, Resonance and Hyperconjugation. Cleavage of Bonds: Homolysis and Heterolysis. shape and reactivity of organic molecules: Nucleophiles and electrophiles. Reactive Intermediates: Carbocations, Carbanions and free radicals. (6 hours) **UNIT IV: Stereochemistry** Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds). Threo and erythro; D and L; cis - trans nomenclature; CIP Rules: R/ S (for upto 2 chiral carbon atoms) and E / Z Nomenclature (for upto two C=C systems). (6 hours). **Unit V Aliphatic Hydrocarbons** Alkanes: (Upto 5 Carbons). Preparation: Catalytic hydrogenation, Wurtz reaction, Kolbe's synthesis, from Grignard reagent. Reactions: Free radical Substitution: Halogenation. Alkenes: (Upto 5 Carbons) Preparation: Elimination reactions: Dehydration of alkenes and dehydrohalogenation of alkyl halides (Saytzeff's rule); Reactions: cis-addition (alk. KMnO4) and trans-addition (bromine), Addition of HX (Markownikoff's and anti-Markownikoff's addition),					

SAGE UNIVERSITY, INDORE * APPROVED * ACADEMIC COUNCIL
Institute of Sciences * SAGE University, Indore
SAGE UNIVERSITY, INDORE * APPROVED

SAGE UNIVERSITY, INDORE

	Hydration, Ozonolysis, Alkynes: (Upto 5 Carbons) Preparation: Acetylene from CaC2 and conversion into higher alkynes; by dehalogenation of tetra halides and dehydrohalogenation of vicinal-dihalides, Reactions: formation of metal acetylides, addition of bromine and alkaline $KMnO_4$, ozonolysis and oxidation with hot alk. $KMnO_4$. (6 hours).
Text Books	1. Unified Chemistry by M.M.N. Tandon Shivlal Agarwals 2. Chemistry by Madan, R L S. CHAND & COMPANY LTD.
References	1. Cotton, F.A., Wilkinson, G. &Gaus, P.L. Basic Inorganic Chemistry, 3rd ed., Wiley. 2. Douglas, B.E., McDaniel, D.H. & Alexander, J.J. Concepts and Models in Inorganic Chemistry, John Wiley & Sons. 3. Huheey, J.E., Keiter, E.A., Keiter, R.L. &Medhi, O.K. Inorganic Chemistry: Principles of Structure and Reactivity, Pearson Education India, 2006.
Course Outcomes	**On completion of the course, the student will be able to:** **CO1:** Explain the principles of atomic structure, including quantum mechanical models, quantum numbers, and atomic orbitals, to interpret atomic behavior. **CO2:** Describe and compare different types of chemical bonding and molecular structures using ionic, covalent, VSEPR, Valence Bond (VB), and Molecular Orbital (MO) theories. **CO3:** Apply concepts of organic chemistry fundamentals such as electronic effects, bond cleavage, reactive intermediates, and aromaticity in problem-solving. **CO4:** Analyze stereochemical aspects of organic compounds and assign configurations using R/S and E/Z nomenclature. **CO5:** Demonstrate knowledge of preparation methods, properties, and reaction mechanisms of aliphatic hydrocarbons (alkanes, alkenes, and alkynes).

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO9	PO10	PSO1	PSO 2	PSO3	PSO4	PSO5	KnowledgeLevels (K_1, K_2, …, K_6)
CO1					3							2				K2
CO2									3						1	K4
CO3	3												2			K2
CO4													3			K2
CO5			1											2		K5

High-3 Medium-2 Low-1

K_1 => Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By
Dr. Siya Upadhyay

Jagrati

Checked By
Dr. Jagrati Singhal

Approved By
Dr. Sandeep Kumar Verma

SAGE UNIVERSITY INDORE * APPROVED * ACADEMIC COUNCIL

Institute of Science * SAGE University, Indore *

SAGE UNIVERSITY INDORE * APPROVED * BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: I**		
Course Name	**Physics-I**		**Course Code**	**SCIMINPH102P**		
Credit Hours	L	T	P	N	**Total Credits**	**2**
	-	-	**4**	-		
Prerequisites (if any)	**Higher Secondary Level Physics.**					
Course Objectives	**The course objectives are as follows-** 1. The Course is aim to give knowledge of use of vectors in physics. 2. The Course is aim to give knowledge of use of differential equations in physics. 3. A course on advanced methods of Mechanics. 4. The course aims to demonstrate the utility and limitations of a variety of powerful calculation techniques and to provide a deeper understanding of the Mechanics. 5. The generality of approaches will be emphasized and illustrative examples from Mechanics will be given.					
List of Practicals	1. Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope. 2. To determine the acceleration due to gravity g in laboratory by using a bar pendulum. 3. To determine the damping coefficient by using bar pendulum. 4. To determine the young's modulus of the material of beam using the cantilever method. 5. To determine the modulus of rigidity of material of wire with the help of Maxwell's needle (dynamical method) 6. To determine the modulus of rigidity of material of wire with the help of torsion pendulum (dynamical method) 7. To determine the coefficient of viscosity of a liquid (glycerin) by stock's method. 8. To determine the value of young's modulus, modulus of rigidity and Poisson's ratio for the material of wire by Searles apparatus (Dynamical method). 9. To determine g by Kater's pendulum. 10. To study the variation of time period with length using a simple pendulum and verify laws of pendulum. 11. To determine the moment of inertia of a flywheel. 12. To determine the modulus of rigidity using static torsion method.					

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY, INDORE

Textbooks	1. University Physics. FW Sears, MW Zemansky and HD Young13/e, 1986. Addison-Wesley 2. Mechanics Berkeley Physics course, v.1: Charles Kittel, et. Al. 2007, Tata McGraw-Hill. 3. Physics – Resnick, Halliday& Walker 9/e, 2010, Wiley
References	1. Engineering Mechanics, Basudeb Bhattacharya, 2nd edn., 2015, Oxford University Press 2. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole
Course Outcomes	**At the conclusion of this course the successful student will be able to:** CO1-Learn about Gradient, Divergence and Curl and their typical applications in physics. CO2-Learn about special type of matrices that are relevant in physics and then learn about vectors. CO3-Get introduced to Elasticity, Surface tension and Viscosity. CO4-Learn different ways of solving second order differential equations and familiarized with singular points. CO5- Learn the fundamentals and applications of relativity.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	1					2									1	K_1, K_2
CO2			3							1		1				K_2, K_3
CO3						1										K_2
CO4				1									2		3	K_1, K_2
CO5			2											1		K_1, K_3

High-3 Medium-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

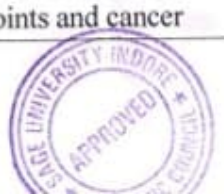
Institute of Science SAGE University, Indore

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: I**		
Course Name	**Zoology - I**		**Course Code**	**SCIMINZO102T**		
Credit Hours	L	T	P	N	**Total Credits**	**2**
	2	**0**	**0**	-		
Prerequisites (if any)	Basic understanding of biology and zoology					
Course Objectives	**The course objectives are as follows-** 1. To explain the fundamental structure and types of cells, including prokaryotic and eukaryotic systems. 2. To describe the structure and function of cell organelles and their role in cellular processes. 3. To explore the mechanisms of membrane transport and cell-cell communication. 4. To analyze the processes of the cell cycle and cell division and relate them to genetic variation and disease.					
Course Content	**Unit 1: Introduction to Cells & Microscopy** **(6 Hours)** Prokaryotic and Eukaryotic Cells (Plant & Animal), Ultrastructure of Prokaryotic cell (E. coli), Ultrastructure of Eukaryotic cell, Microscopy: Simple and Compound Microscopes, Micrometry, Electron Microscopy (TEM, SEM), Types of Stains: Acidic, Basic, Neutral **Unit II: Plasma Membrane Structure & Transport** **(6 Hours)** Structure of Plasma Membrane Models: Fluid Mosaic Model, Unit Membrane Model, Danielli-Davison Model, Membrane transport mechanisms: Passive Transport (Diffusion, Osmosis), Facilitated Transport, Active Transport, Bulk Transport: Endocytosis, Exocytosis. **Unit III: Cell-Cell Communication & Junction** **(6 Hours)** Tight Junctions, Adherent Junctions Gap Junctions, Desmosomes and Hemidesmosomes, Cell Adhesion Molecules (CAMs), Extracellular Matrix (ECM) and its role. **Unit IV: Cell Organelles** **(6 Hours)** Nucleus and Nuclear Pore Complex, Endoplasmic Reticulum (Rough and Smooth), Golgi Complex, Lysosomes, Ribosomes, Peroxisomes, Mitochondria (Structure and Function) **Unit V: Cell Cycle & Division** **(6 Hours)** Cell Cycle (Phases and Regulation), Mitosis: Stages and Significance, Meiosis: Stages and Significance, Genetic Variations: Crossing Over, Independent Assortment, Cell cycle checkpoints and cancer					







SAGE UNIVERSITY, INDORE

Textbooks	1. Verma, P.S. and Agarwal, V.K. (2022). Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Company Ltd., New Delhi. 2. Deepti Gupta (2020). Cell Biology. Rastogi Publications, Meerut. 3. Powar, C.B. (2021). Cell Biology (Cytology, Biomolecules and Molecular Biology). Himalaya Publishing House, Mumbai.
References	1. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., & Walter, P. (2017). Molecular Biology of the Cell (6th ed.). Garland Science, New York. 2. Lodish, H., Berk, A., Kaiser, C.A., et al. (2021). Molecular Cell Biology (9th ed.). W.H. Freeman & Company. Karp, G. (2019). Cell and Molecular Biology: Concepts and Experiments (8th ed.). Wiley.
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Explain the structural and functional differences between prokaryotic and eukaryotic cells. **CO2**: Compare various models of plasma membrane and explain different types of membrane transport mechanisms. **CO3:** Analyze types of cell junctions and the extracellular matrix and explain their significance in cell communication. **CO4:** Illustrate the structure and function of key cellular organelles and describe their interrelationships. **CO5:** Evaluate the stages of mitosis and meiosis and interpret their implications for genetic variation and cancer.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	2	1	2	1	1	1	2	1	1		3		2	3	K1, K2, K3, K4
CO2	3	2	2	2	2	1	1	2	1	1		3		2	2	K2, K3, K4
CO3	2	3	2	2	2	1	1	2	1	1		2		2	2	K2, K3, K4
CO4	3	2	2	2	2	1	1	2	1	1		3		2	3	K2, K3, K4, K5
CO5	3	3	2	3	2	2	1	2	1	2		3		2	2	K2, K3, K4, K5

High-3 Medium-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			Department Name: Forensic Science			
Recommended Programs: Bachelor of Science in Forensic Science			Semester: I			
Course Name	Zoology - I		Course Code	SCIMINZO102P		
Credit Hours	L	T	P	N	Total Credits	2
	0	0	4	-		
Prerequisites (if any)	Basic understanding of biology and zoology					
Course Objectives	**After studying this paper, the students will know –** 1. To enable students to explore and differentiate the cellular structure of plant and animal cells through microscopic observation. 2. To provide understanding of the principles and applications of microscopy and micrometry. 3. To train students in classical cytological techniques, including staining and preparation of temporary and permanent slides. 4. To develop skills for identifying and analyzing stages of cell division and cellular components using staining and imaging techniques.					
List of Practicals	1. Visualization of animal cells. 2. Visualization of plant cells. 3. Study of principle and working of simple and compound microscope. 4. Measurement of microscopic objects using micrometry. 5. Identification of ultrastructure of different cell organelles from electron micrographs / video. 6. Staining and visualization of mitochondria by Janus green stain. 7. Study of permanent slides of mitosis and meiosis. 8. Preparation of temporary stained squash of onion root tip to study various stages of mitosis. 9. Preparation of temporary stained squash of onion root tip to study various stages of meiosis. 10. Visualization of nuclear fraction by acetocarmine stain. 11. Preparation and observation of cheek epithelial cell slides using methylene blue staining. 12. Determination of cell size and field diameter under different magnifications using ocular and stage micrometers. 13. Observation and identification of plastids (chloroplast, chromoplast, leucoplast) in different plant tissues. 14. Demonstration of plasmolysis and deplasmolysis in plant cells using different salt solutions. 15. Isolation and staining of chromosomes from onion root tip for detailed observation of mitotic stages.					
Text Books	1. Verma, P.S. and Agarwal, V.K. (2022). Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Company Ltd., New Delhi. 2. Deepti Gupta (2020). Cell Biology. Rastogi Publications, Meerut. Powar, C.B. (2021).					

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	Cell Biology (Cytology, Biomolecules and Molecular Biology). Himalaya Publishing House, Mumbai.
References	1. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., & Walter, P. (2017). Molecular Biology of the Cell (6th ed.). Garland Science, New York. 2. Lodish, H., Berk, A., Kaiser, C.A., et al. (2021). Molecular Cell Biology (9th ed.). W.H. Freeman &Company. Karp, G. (2019). Cell and Molecular Biology: Concepts and Experiments (8th ed.). Wiley.
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Describe and differentiate structural features of plant and animal cells using microscopy. **CO2:** Demonstrate the use of simple and compound microscopes and apply micrometry techniques for object measurement. **CO3:** Analyze ultrastructural details of cell organelles using electron micrographs or video-based learning. **CO4:** Evaluate the stages of mitosis and meiosis through prepared and temporary quash Slides. **CO5:** Design and carry out staining procedures to visualize cell structures such as mitochondria and nuclei.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ... K_6)
CO1	3	2	2	2	2	1	1	2	1	1					1	K_1, K_2
CO2	2	3	3	2		1	1	2	2	2		1				K_2, K_3
CO3	3	3	2	2	3	1	1	2	1	2						K_2
CO4	3	3	3	3	2	1	1	2	1	2			2		3	K_1, K_2
CO5	2	3	3	2	3	2	1	2	2	2				1		K_1, K_3

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science			**Semester: I**			
Course Name	**Botany – I**		**Course Code**	**SCIMINBO102T**		
Credit Hours	L	T	P	N	**Total Credits**	**2**
	2	**0**	**0**	**-**		
Prerequisites (if any)	Knowledge of basic concepts of plant biology					

Course Objectives

The course objectives are as follows-

1. To provide students with a comprehensive understanding of plant sciences, including its subfields, significance, and applications in industries such as agriculture, pharmaceuticals, biofuels, and environmental sustainability.
2. To enable students to understand the concept of plant diversity, its importance, and classification into major groups like algae, fungi, bryophytes, pteridophytes, gymnosperms, and angiosperms.
3. To examine the economic relevance of plant groups and their uses in industries such as food, medicine, biofuels, and bioremediation.
4. To study structure, classification, and reproductive patterns of plants with examples.
5. To develop practical knowledge of plant applications in industries and environmental processes.

Course Content

Unit 1: Plant Sciences & Plant Diversity **(6 Hours)**

Plant sciences, subfields of plant sciences, importance of plant sciences, applications of plant sciences, and career opportunities in plant sciences.

Unit II: Algae & Fungi **(6 Hours)**

Definition, general characters of algae with suitable examples, classification, morphology, and reproduction in Nostoc, Economic importance of algae –Food, Feed and beverage industry, Cosmetics and skin care, pharmaceutical industry, Biofuel industry, Bioremediation, waste water treatment, carbon sequestration. Definition, general characters of fungi with suitable examples, classification, morphology, and reproduction in Agaricus. Economic importance of Fungi, Food and beverage industry, agriculture, pharmaceutical industry, Environment applications, Textile industry, biofuel industry, paper industry.

Unit III: Lichen **(6 Hours)**

Definition, general characters of Lichen with suitable examples – crustose, foliose, fruticose, types of Lichens, Economic importance of Lichens, Food and beverages, Medicine, Cosmetics, Dyes and pigments, Environmental monitoring, Bioremediation.

Unit IV: Bryophytes & Pteridophytes **(6 Hours)**

Definition and general characters of bryophytes with suitable examples. Classification, morphology, and reproduction in Riccia. Economic importance of Bryophytes, Horticulture and landscaping, Medicine, Food and beverages, Environmental

	monitoring, Bioremediation. Definition and general characters of pteridophytes with suitable examples. Classification, morphology, and reproduction in Azolla. Economic importance of pteridophytes. Ornamental and Landscaping, Medicine, Food, Fodder and Beverages, Environmental monitoring. **Unit V: Gymnosperms &Angiosperms** **(6 Hours)** Definition, general characters of gymnosperms with suitable examples, classification, Morphology and reproduction in Cycas. Economic importance of gymnosperms – Ornamental and Landscaping Medicine, Food, Fodder and beverages, Environmental Monitoring, Dyes, Bioremediation, Timber and wood. **Angiosperms** – Definition, General characters of angiosperms with suitable example. Economic importance of angiosperms, Ornamental and Landscaping, Medicine, Food, fodder and beverages, Environmental monitoring, Dyes and pigments, Biofuels and bioplastics, Timber, fiber.
Textbooks	1. Ainsworth, Sussman and Sparrow (1973) – The Fungi. Vol IV – A and IV – B. Academic Press 2. Bendre, Ashok and Kumar, Ashok (1993) – A Textbook of Practical Botany. Rastogi publications. Meerut 3. Bilgrami, K. S. and Saha, L. C. (1992) – Textbook of Algae. CBS Publishers and Distributors, Delhi 4. Chamberlain, C. J (1934) – Gymnosperms – Structure and Evolution. Chicago. 5. Coulter, J. N and Chamberlain, C. J (1917) – Morphology of Gymnosperms. Chicago.
References	1. Davis, P. H. and Heywood V. H. (1963) – Principles of Angiosperm Taxonomy. Oliver and Byod. Publ. London. 2. Dube, H. C (1990) – An Introduction to Fungi. Vikas Publishing House Pvt Ltd., Delhi. 3. Dutta, S. C (1988) – Systematic Botany. Wiley Eastern Ltd., New Delhi 4. Gangulee, Das and Dutta (2002) – College Botany. Vol. I, New Central Book Agency (P) Ltd. 5. Krishnamurthy, V (2000) – Algae of India and Neighboring Countries. Chlorophyl
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Students will be able to understand and classify plants into major groups (algae, fungi, lichen, bryophytes, pteridophytes, gymnosperms and angiosperms) based on morphological and reproductive features. **CO2:** Students will be able to identify economic significance of various plant groups, recognizing their applications in industries such as pharmaceuticals, biofuels, textiles and environmental sustainability. **CO3:** Students will gain ability to describe the reproductive cycles and morphology characteristics of plants like algae, fungi, lichens, bryophytes, and others with examples Nostoc, Agaricus, Riccia, Azolla, Cycas and others **CO4:** Students will understand various applications of plant sciences in real world scenarios such as environmental monitoring, bioremediation, medicine, and industrial processes like biofuel production, food processing and landscaping. **CO5:** By conclusion of course, students will be well equipped to pursue careers or further

APPROVED ACADEMIC COUNCIL
SAGE University, Indore
APPROVED BOARD OF MANAGEMENT

	education in fields related to plant biology, biotechnology, agriculture, environmental science and various industries benefitting from plant derived product and services.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	2	1	2	1	1	2	2	1	1		2		2		K1, K2, K3
CO2	3	2	1	2	2	2	3	2	1	2		3		2	2	K2, K3, K4, K5
CO3	3	2	2	2	2	1	2	2	1	1		2		2		K2, K3, K4
CO4	2	3	2	3	3	2	3	2	2	3		3		2	2	K2, K3, K4, K5
CO5	2	2	2	2	2	2	2	3	3	3		3		2	2	K2, K3, K4, K5

High-3 Medium-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

Institute of Science SAGE University, Indore

APPROVED ACADEMIC COUNCIL

APPROVED

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: I**		
Course Name	**Botany - I**		**Course Code**	**SCIMINBO102P**		
Credit Hours	L	T	P	N	Total Credits	2
	0	0	4	-		
Prerequisites (if any)	Knowledge of basic concepts of plant biology					
Course Objectives	**After studying this paper, the students will know –** 1. To provide students with a comprehensive understanding of plant sciences, including its subfields, significance, and applications in industries such as agriculture, pharmaceuticals, biofuels, and environmental sustainability. 2. To enable students to understand the concept of plant diversity, its importance, and classification into major groups like algae, fungi, bryophytes, pteridophytes, gymnosperms, and angiosperms. 3. To examine the economic relevance of plant groups and their uses in industries such as food, medicine, biofuels, and bioremediation. 4. To study structure, classification, and reproductive patterns of plants with examples. 5. To develop practical knowledge of plant applications in industries and environmental processes.					
List of Practicals	1. To study the classification and Morphology in Nostoc. 2. To study application of algae w.r.t to Food, Feed and Beverage industry; Cosmetics and Skin care industry; Pharmaceutical industry; Bio- fuel industry; Bioremediation, Waste water management; Carbon sequestration. 3. To study classification and Morphology in Agaricus. 4. To study application of fungi w.r.t Food and Beverage industry; Agriculture; Pharmaceutical Industry; Environmental applications; textile industry; Biofuel industry; paper industry 5. To study types of lichen – crustose, foliose and fructose 6. To study application of lichen w.r.t Food and Beverages; Medicine; Cosmetics; Dyes and Pigments; Environmental monitoring; Bioremediation. 7. To study classification and morphology in Riccia 8. To study applications of bryophytes w.r.t horticulture and landscaping, medicine, food and beverages, Environmental monitoring; Bioremediation.					



	9. To study classification and morphology in Azolla 10. To study applications of pteridophytes w.r.t ornamental and landscaping, medicine, food, fodder and beverages, environmental monitoring, dyes.
Text Books	1. Ainsworth, Sussman and Sparrow (1973) – The Fungi. Vol IV – A and IV – B. Academic Press 2. Bendre, Ashok and Kumar, Ashok (1993) – A Textbook of Practical Botany. Rastogi publications. Meerut 3. Bilgrami, K. S. and Saha, L. C. (1992) – Textbook of Algae. CBS Publishers and Distributors, Delhi 4. Chamberlain, C. J (1934) – Gymnosperms – Structure and Evolution. Chicago. 5. Coulter, J. N and Chamberlain, C. J (1917) – Morphology of Gymnosperms. Chicago.
References	1. Davis, P. H. and Heywood V. H. (1963) – Principles of Angiosperm Taxonomy. Oliver and Byod. Publ. London. 2. Dube, H. C (1990) – An Introduction to Fungi. Vikas Publishing House Pvt Ltd., Delhi. 3. Dutta, S. C (1988) – Systematic Botany. Wiley Eastern Ltd., New Delhi 4. Gangulee, Das and Dutta (2002) – College Botany. Vol. I, New Central Book Agency (P) Ltd. 5. Krishnamurthy, V (2000) – Algae of India and Neighbouring Countries. Chlorophyl
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1** Students will be able to understand and classify plants into major groups (algae, fungi, lichen, bryophytes, pteridophytes, gymnosperms and angiosperms) based on morphological and reproductive features. **CO2** Students will be able to identify economic significance of various plant groups, recognizing their applications in industries such as pharmaceuticals, biofuels, textiles and environmental sustainability. **CO3** Students will gain ability to describe the reproductive cycles and morphology characteristics of plants like algae, fungi, lichens, bryophytes, and others with examples Nostoc, Agaricus, Riccia, Azolla, Cycas and others **CO4** Students will understand various applications of plant sciences in real world scenarios such as environmental monitoring, bioremediation, medicine, and industrial processes like biofuel production, food processing and landscaping. **CO5** By conclusion of course, students will be well equipped to pursue careers or further education in fields related to plant biology, biotechnology, agriculture, environmental science and various industries benefitting from plant derived product and services.

SAGE UNIVERSITY APPROVED ACADEMIC COUNCIL
Institute of Sciences SAGE University, Indore
UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	2	1	2	1	1	2	2	1	1		3		2	2	K2, K3, K4
CO2	3	2	1	2		2	3	2	1	2		3		2	2	K2, K3, K4, K5
CO3	3	2	2	2	2	1	2	2	1	1		3		2	2	K2, K3, K4
CO4	2	3	2	3	3	2	3	2	2	3		3		2	2	K2, K3, K4, K5
CO5	2	2	2	2	2	2	2	3	3	3		2		2		K1, K2, K3

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

Institute of Sciences * SAGE University, Indore *

SAGE * APPROVED * ACADEMIC COUNCIL * INDORE

SAGE UNIVERSITY, INDORE

Program Code: B Sc (FS)

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: I**		
Course Name	**Fundamentals of Forensic Lab Techniques**		**Course Code**	**SCISENFT104T**		
Credit Hours	L	T	P	N	Total Credits	**3**
	3	**0**	**0**	-		
Prerequisites (if any)	**Basic understanding of laboratory working and its environment**					
Course Objectives	**The course objectives are as follows: –** 1. Teach students basic laboratory safety rules and Good Laboratory Practices. 2. Help students understand laboratory equipment and glassware. 3. Provide basic knowledge of measurement and solution preparation. 4. Train students in simple laboratory techniques used in experiments. 5. Make students aware of proper documentation, reporting, and ethics in laboratory work.					
Course Content	**UNIT- 1 Basics of Laboratory Safety and Good Laboratory Practices (9 Hours)** Good Laboratory Practices (GLP) principles, Laboratory rules and discipline, Personal Protective Equipment (PPE), Chemical, biological, and physical hazards, Hazard symbols and risk assessment, Chemical handling and storage, Sanitization, Waste management and disposal methods, Emergency Procedures, Documentation and Report Writing. **UNIT- 2 Basics of Laboratory Apparatus and Glassware (9 Hours)** Introduction to Laboratory Apparatuses and Glassware, Types of Laboratory Materials, Types and properties of laboratory glass, Classification of Glassware, Cleaning, Drying and maintenance of glassware, Heating and supporting apparatus, Transfer and Handling Equipment, Measurement of Accuracy, Precision and Errors, Common precautions for handling glassware or apparatus. **UNIT- 3 Principles of Measurement and Solution Making (9 Hours)** Introduction to Laboratory measurement instruments, Units of Mass, Volume, and Temperature, Conversion of units, Types of balances (Analytical and Digital), Reading					







	of meniscus, Calibration (basic concept), Concept of Solution, Solute, and Solvent, Chemistry of Solutions, Types of Solutions (Dilute and Concentrated), Preparation of standard solutions, Dilution techniques, Preparation of reagents. **UNIT-4 Fundamentals of Lab Skills and Techniques (9 Hours)** Heating and Drying techniques (Hot Air Oven, Water Bath, Autoclave and Laminar Air Flow) Introduction to pH Instrument, Preparation of buffer solution for pH, Use of indicators, Filtration, Centrifugation, Evaporation, Crystallization, Distillation techniques, Basics of Microscopy and its types, Introduction to Chromatography and its types, Concept of Spectrophotometry and its types (Basic Concept). **UNIT- 5 Documentation, Ethics and Professional Conduct (9 Hours)** Introduction to Laboratory Documentation, Types of Laboratory Records (Formats) Data Management and Data Integrity, Standard Operating Procedures (SOPs), Interpretation and presentation of Results, Preparation of Laboratory Reports, Basics of Laboratory Ethics and Good Scientific Practices, Importance of lab or professional ethics in scientific work, Code of conduct in laboratory environment. Role of ethics in Quality Control and Quality Assurance, Ethical issues in Modern Laboratory Practices.
Text Books	1.Skoog, D.A., West, D.M., Holler, F.J. & Crouch, S.R. — *Fundamentals of Analytical Chemistry* 2.Vogel, A.I. — *Vogel's Textbook of Quantitative Chemical Analysis*
References	1.Harris, D.C. — *Quantitative Chemical Analysis* 2.Mendham, J., Denney, R.C., Barnes, J.D., Thomas, M. — *Vogel's Quantitative Chemical Analysis*
Course Outcomes	**At the conclusion of this course the successful student will be able to:** CO:1 Understand and follow laboratory safety rules and Good Laboratory Practices (GLP). CO:2 Identify and properly use basic laboratory apparatus and glassware. CO:3 Perform basic measurements and prepare solutions accurately. CO:4 Apply common laboratory techniques such as filtration, centrifugation, and

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL
Institute of Sciences SAGE University, Indore
SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

	pH measurement. CO:5 Maintain laboratory records and follow ethical and professional practices.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	2	1	2	1	2	3	2	1	2	2	2	2		2	3	K1, K2, K3, K4
CO2	2	2	3	2		2	1	1	2	2		2		2	3	K2, K3, K4
CO3	2	3	3	2	3	2	1	1	2	2		3		2	3	K2, K3, K4, K5
CO4	2	3	3	2	3	2	1	1	2	2	2	3		2	3	K2, K3, K4, K5
CO5	1	2	2	1	2	3	1	3	2	3	2	2		3	2	K2, K3, K4, K5

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

Institute of Sciences * SAGE University, Indore *

SAGE UNIVERSITY INDORE * APPROVED * ACADEMIC COUNCIL *

SAGE UNIVERSITY INDORE * APPROVED * BOARD OF MANAGEMENT *

SAGE UNIVERSITY INDORE						
Institute Name: Training			**Department Name: Training**			
Recommended Programs: BA, BDES, BAJMC, BSC, BPA			**Semester: I**			
Course Name	**PROFESSIONAL DEVELOPMENT – I**		**Course Code**	**TRNAENPD001P**		
Credit Hours	**L**	**T**	**P**	**N**	**Total Credits**	**2**
	0	**0**	**4**	**0**		
					Total Lecture:60	
	PROFESSIONAL DEVELOPMENT – I				**0– 0–2**	
Course Objectives	• To develop a positive attitude and growth mindset among students by enhancing self-awareness, identifying limiting beliefs, and building resilience to overcome challenges. • To strengthen written communication skills through structured practice in planning, drafting, editing, and professional writing formats such as reports, business correspondence, and Minutes of Meeting. • To enhance advanced speaking skills by enabling students to effectively participate in debates, group discussions, storytelling, and professional interactions such as interviews and presentations. • To build emotional intelligence competencies, including self-awareness, self-regulation, empathy, and social skills, for improved interpersonal effectiveness and decision-making. • To equip students with conflict resolution and negotiation skills by applying appropriate strategies, communication techniques, and decision-making approaches to achieve mutually beneficial outcomes.					
Pre-requisites:	**Nil**					
UNIT	**CONTENT**					**HOURS**
I	**Communication** • Introduction, Meaning, and Significance • Process of Communication • Types of Communication • 7 C's of Communication • Barriers to Communication and Ways to Overcome Them • Channels/Flow of Communication					**4**

Institute of Sciences ★ SAGE University, Indore ★
APPROVED ★ ACADEMIC COUNCIL ★
SAGE UNIVERSITY INDORE ★ APPROVED ★ BOARD OF MANAGEMENT

II	**Etiquette, Body Language & Non-verbal Communication** • Understanding Professional Etiquettes • Grooming & Corporate Dressing • Greetings and Introductions • Kinesics, Haptics, Proxemics & Olfactics • Para-language and voice modulation • Mobile etiquettes • Dinning Etiquettes	12
III	**Functional Grammar in Use** • Parts of Speech-Types of nouns (Common, Proper, Abstract, Concrete, Collective), Countable vs. uncountable nouns, • Noun phrases, Possessive nouns, Noun modifiers, Plural forms and irregular nouns • Pronouns: Personal pronouns (subjective, objective), possessive pronouns vs. possessive adjectives, Reflexive and emphatic pronouns • Verbs: Main verbs and auxiliary verbs, Linking verbs vs. action verbs, Transitive and intransitive verbs. • Prepositions: Prepositions of time, place, direction, reason, instrument • Determiners: Articles, Demonstratives • Conjunctions & Interjections	18
IV	**Listening & Speaking Skills** • Listening for general understanding • Identifying main ideas in short conversations • Listening to announcements, instructions, and simple dialogues • Audio exercises: recognizing tone, mood, and purpose **Speaking Skills** • Introducing oneself and others (practice based) • Using everyday expressions for greetings, gratitude, and apologies (practice based) • Role plays: at a shop, in a classroom, asking for directions Describing people, objects, and places in simple sentences (practice based)	14
V	**Reading & Writing Skills** • Reading short paragraphs, notices, emails, and invitations • Skimming & Scanning for general meaning • Vocabulary building through short reading passages • Writing personal information • Informal messages, and short notes • Guided sentence writing • Picture-based description	12
Course Outcomes (as per Bloom's Taxonomy)		
At the end of the course the students will be able to:		

Institute of Science SAGE University, Indore
SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL
SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

CO 1	**Analyze, and apply** the principles of communication by understanding its process, types, channels, and barriers to ensure clear, effective, and purposeful interaction.
CO 2	**Demonstrate** appropriate professional behavior, grooming standards, and effective use of body language in personal and professional settings.
CO 3	**Apply and demonstrate** correct usage of grammatical structures in constructing clear, accurate, and meaningful sentences in spoken and written communication.
CO 4	**Apply and demonstrate** effective listening and speaking skills by interpreting spoken content (main ideas, tone, and purpose) and engaging in clear, context-appropriate verbal communication through everyday interactions, role plays, and descriptive expressions.
CO5	**Read,** interpret and produce simple coherent texts using reading and writing techniques.
Text Books:	**Raymond Murphy** – *English Grammar in Use (Advanced)* – Cambridge University Press "Practical English Usage" by Michael Swan **Communication Skills"** – Sanjay Kumar and Pushp Lata **Michael Swan** – *Practical English Usage* – Oxford University Press
Reference Books:	**Martin Hewings** – *Advanced Grammar in Use* – Cambridge University Press"Collins Vocabulary and Grammar" by Nick Ceramella **Norman Lewis** – *Word Power Made Easy* – Goyal Publishers **Modern Manners: Tools to Take You to the Top"** – Dorothea Johnson & Liv Tyler **Business Communication: Concepts, Cases, and Applications** — *Authors:* P. D. Chaturvedi & Mukesh Chaturvedi **The Definitive Book of Body Language** — *Authors:* Allan Pease & Barbara Pease

. Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO 2	PO3	PO 4	PO5	PO 6	PO 7	PO8	PO9	PO 10	PSO1	PSO2	PSO 3	PSO4	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3		3								2				K1,K2
CO2				3	3								2		K1,K2
CO3								3	3			2			K1,K2
CO4									3						K1,K2
CO5	3				3						2			2	K1,K2

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By:
(Dr Jaya Sharma.)

Checked By:
(Dr. Nitika Vats)

HEAD OF DEPARTMENT
TRAINING
SAGE UNIVERSITY, INDORE

Approved By:
(Dr Sandeep K Verma)

APPROVED ACADEMIC COUNCIL SAGE UNIVERSITY INDORE

APPROVED BOARD OF MANAGEMENT SAGE UNIVERSITY INDORE

SAGE University Indore

Institute of Sciences

Forensic Science Department

CHOICE BASED CREDIT SYSTEM (NEP-2020)

PROGRAM STRUCTURE

Effective for Academic Session: 2026-27

Program: Bachelor of Science in Forensic Science

Semester: II

Program Code: B Sc [FS]
Admission Batch: 2026-27

Subject wise Distribution of Marks and Corresponding Credits

S. No.	Subject Code	Category	Subject Title	Maximum Marks Allotted							Hours/week						Credits	Credits Hours
				Theory (100 Marks)			Practical/Studio (100 Marks)			Total Marks								
				End Sem Exam (ESE)	Continuous Internal Evaluation (CIE)		End Sem. Exam (ESE) For Practical and Viva	Continuous Internal Evaluation (CIE)			L	T	P	Studio/ Field Work/ Assignment	S/M	NTCC		
					Mid Sem Test (MST)	Attendance/ Quiz /Assig./ Presentations		Lab Work / WPR	Attendance/Assignment /Viva/Lab Manual									
1	SCIMCNQD201T	MC	Questioned Document and Dermatoglyphics	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
2	SCIMCNQD201P	MC	Questioned Document and Dermatoglyphics	-	-	-	30	10	10	50	0	0	6	-	-	-	3	6
3	SCIMCNCS202T	MC	Crime Scene Management	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
4	SCIMCNCS202P	MC	Crime Scene Management	-	-	-	30	10	10	50	0	0	6	-	-	-	3	6
5	SCIMINCH203T/SCIMINPH203T/SCIMINZO203T/SCIMINBO203T	MI	Chemistry II/Physics II/Zoology II/Botany II	60	20	20	-	-	-	100	2	0	0	-	-	-	2	2
6	SCIMINCH203P/SCIMINPH203P/SCIMINZO203P/SCIMINBO203P	MI	Chemistry II/Physics II/Zoology II/Botany II	-	-	-	30	10	10	50	0	0	4	-	-	-	2	4
7	TRNAENPD002P	AE	Professional Development-II	-	-	-	60	20	20	100	-	-	4	-	-	-	2	4
8	VACVCNIK002N	VC	Introduction to Indian Knowledge System	-	-	-	-	20	30	50	0	0	-	-	-	4	2	4
			TOTAL	**180**	**60**	**60**	**150**	**70**	**80**	**600**	**8**	**0**	**20**	**0**	**0**	**4**	**20**	**32**

Legends		
L= Lecture	1 Hr	1 CR
T= Tutorial	1 Hr	1 CR
P= Practical	2 Hr	1 CR
S= Studio	1 Hr	1.5 CR
N= Non Tecahing Credit Course (NTCC)	2 Hr	1 CR
M= MOOC	SWAYAM/NPTEL	Certificate
BM = Blended MOOC	1 Hr	1 CR

NOTE :	
	Weekly Progress Report (WPR) is for NTCC
	Assignment / VIVA for NTCC
	Assignment / VIVA / Lab manual for P

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

SAGE UNIVERSITY INDORE APPROVED BOARD OF STUDIES

Institute of Sciences SAGE University Indore

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: II**		
Course Name	**Questioned Document and Dermatoglyphics**		**Course Code**	**SCIMCNQD201T**		
Credit Hours	L	T	P	N	**Total Credits**	3
	3	**0**	**0**	-		
Prerequisites (if any)	**Questioned Document and Forensic Dermatoglyphics**					
Course Objectives	**The course objectives are as follows-** 1. Introduce questioned documents, handwriting principles, and examination tools. 2. Develop skills for handwriting and document comparison. 3. Explain document forgeries, security documents, and fingerprint basics. 4. Teach fingerprint classification and latent print development 5. Train in preservation and analysis of fingerprints and other impressions.					
Course Content	**Unit 1 Questioned Documents and tools for document examination (9 Hours)** Definition of questioned documents. Handwriting- Principles of handwriting Handling, Handling, preservation of documents, Various types of forensic documents- Questioned, requested and Admitted writings, Genuine and forged documents, Ultraviolet Visible, Infrared, Photomicrography, Microphotography, Video Spectral Comparator (VSC), Electrostatic Detection Apparatus (ESDA), **Unit II Comparison of Questioned Documents and Handwriting (09 Hours)** Features of Writing, Class and Individual Characters, Natural Variations and Fundamental Divergences in Handwritings. Role of Natural Variation in Document Examination, Comparison of Handwriting, Exemplar Samples. Standards For Comparison of Handwriting. Comparison of Paper, Ink, Printed Documents, Typed Documents, Identification of Typewritten Documents. Xeroxed Documents (B/W and Colored Document) Collection of Requested Handwritings **Unit III Forgeries & Basics of Fingerprint (9 Hours)** Forgeries-Alterations in Documents (Including Erasures, Additions, Over-Writings and Obliterations, and their Examinations), Indented and Invisible Writings. Charred Documents. Examination of Indian and Counterfeit Currency Notes, Passports, Visas and Stamp Papers. Disguised Writing and Anonymous Letters. Secret Writing. Basics of Fingerprint- Introduction and historical development of Fingerprint, Formation of ridges in fetus, Fundamental principles of Fingerprints, Types of fingerprints, Fingerprint patterns, Characteristics/ Minutiae of Fingerprint.					

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY APPROVED ACADEMIC COUNCIL

BOARD OF MANAGEMENT SAGE UNIVERSITY INDORE APPROVED

SAGE UNIVERSITY, INDORE

	Unit IV Classification and Development of Fingerprint (9 Hours) **Classification of Fingerprint-** Henry's Classification (Ten Digit Classification), Secondary Classification, Sub Secondary classification, Single Digit Classification, Major Classification, Key Classification, Automated fingerprint Identification System (AFIS) Fingerprinting the deceased. **Development of Fingerprints-**Type of prints, Latent Print and Constituents of Sweat residue, Detection of Latent Fingerprints (Physical and Chemical) and their Mechanism **Unit V Preservation of Fingerprints and Analysis of Other Impressions (9 Hours)** **Preservation of Fingerprints-**Preservation of developed fingerprints. Digital imaging for fingerprint enhancement, **Other Impressions-** Footprints (Casting, Negative and Positive Footprints, Electrostatic Lifting of Latent Footprints), Palm Prints, Lip Prints (Nature, Location, Collection and Examination of Lip print), Forensic significance of Rugoscopy, Poroscopy and Edgeoscopy.
Textbooks	1. R.N. Motris, Forensic Handwriting Identification: Fundamental Concepts and Principles, Academic Press, London (2000). 2. E. David, The Scientific Examination of Documents- Methods and Techniques. 2nd Edition, Taylor and Francis, Hants (!997). 3. J.E. Cowger, Friction RIdge Skin, CRC Press, Boca Raton (1983) 4. D.A. Ashbaugh, Quantitative-Qualitative Friction Ridge Analysis, CRC Press, Boca Raton (2000)
References	1. O. Hilton, Scientific Examination of Questioned Documents, CRC Press, Boca Raton (1982). 2. A. A. Moensssens, J. Starrs, C.E. Henderson and F.E. Inbau, Scientific Evidence in Civil and Criminal Cases, 4th Edition, Foundation Press, New York (1995) 3. C. Champod, C, Lermard, P. Margot an M. Stoilovic. Fingerprints and other Ridge Skin Impressions, CRC Press, Boca Raton (2004). 4. Lee and Gaensleen's, Advances in Fingerprint Technology, 3rdEdition, R.S. Ramotowski (Ed.), CRC Press. Boca Raton (2013)
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Understand questioned documents, principles of handwriting, and tools used in forensic document examination. **CO2:** Compare questioned and standard documents using handwriting characteristics, natural variations, and examination of paper, ink, and printed materials. **CO3:** Identify document forgeries, alterations, security documents, and explain the basics of fingerprint science. **CO4:** Apply fingerprint classification systems and methods for development and detection of latent fingerprints.

Institute of Science SAGE University, Indore
SAGE UNIVERSITY, INDORE APPROVED ACADEMIC COUNCIL

SAGE UNIVERSITY, INDORE

	CO5: Preserve and analyze fingerprint evidence and other impressions such as footprints, palm prints, and lip prints for forensic identification.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	2	1	2	3	2	-	1	-	1	3	3		3	3	K1, K2, K3, K4
CO2	3	3	2	3	3	2	-	2	--	1	3	3		3	3	K2, K3, K4, K5
CO3	3	2	1	3	2	2	-	1	-	1	3	3		3	3	K2, K3, K4, K5
CO4	2	3	3	3	3	2	-	1	2	2	3	3	2	3	3	K2, K3, K4, K5
CO5	2	3	3	3	3	3	-	2	2	2	3	3	2	3	3	K2, K3, K4, K5

High-3 Medium3-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

Institute of Sciences * SAGE University, Indore *

SAGE UNIVERSITY INDORE * APPROVED * ACADEMIC COUNCIL *

SAGE UNIVERSITY INDORE * APPROVED * BOARD OF MANAGEMENT *

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: II**		
Course Name	**Questioned Document and Dermatoglyphics**		**Course Code**	**SCIMCNQD201P**		
Credit Hours	L	T	P	N	**Total Credits**	**3**
	0	0	**6**	-		
Prerequisites (if any)	**Questioned Document and Forensic Dermatoglyphics**					
Course Objectives	**The course objectives are as follows: –** 1. Introduce questioned documents, handwriting principles, and examination tools. 2. Develop skills for handwriting and document comparison. 3. Explain document forgeries, security documents, and fingerprint basics. 4. Teach fingerprint classification and latent print development 5. Train in preservation and analysis of fingerprints and other impressions.					
List of Practicals	1. To identify handwriting characters. (Class and Individual) 2. To study natural variations in handwriting. 3. To detect simulated forgery in signature. 4. To detect traced forgery signature. 5. To study the line quality defects in handwriting samples. 6. To examine the security features of currency notes. 7. To study alterations, obliterations and erasures in handwriting samples. 8. To decipher intended handwritings with the help of graphite powder. 9. To carry out secret handwritten with various natural substances 10. To collect requested samples from the suspect by dictation at various speeds and time. 11. To record plain and rolled fingerprint. 12. To identify different fingerprint patterns. 13. To identify core and delta. 14. To study and identify characteristics / Minutiae of fingerprint. 15. To carry out ridge tracing and ridge counting. 16. To carry out ten-digit classification of fingerprint. 17. To investigate physical methods of fingerprint detection. 18. To investigate chemical methods of fingerprint detection. 19. To investigate fuming methods of fingerprint detection. 20. To prepare cast of foot prints. 21. To study and identify lip prints.					

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY INDORE APPROVED

SAGE UNIVERSITY, INDORE

Text Books	1. R.N. Motris, Forensic Handwriting Identification: Fundamental Concepts and Principles, Academic Press, London (2000). 2. E. David, The Scientific Examination of Documents- Methods and Techniques. 2nd Edition, Taylor and Francis, Hants (!997). 3. J.E. Cowger, Friction RIdge Skin, CRC Press, Boca Raton (1983) 4. D.A. Ashbaugh, Quantitative-Qualitative Friction Ridge Analysis, CRC Press, Boca Raton (2000)
References	1. O. Hilton, Scientific Examination of Questioned Documents, CRC Press, Boca Raton (1982). 2. A. A. Moensssens, J. Starrs, C.E. Henderson and F.E. Inbau, Scientific Evidence in Civil and Criminal Cases, 4th Edition, Foundation Press, New York (1995) 3. C. Champod, C, Lermard, P. Margot an M. Stoilovic. Fingerprints and other Ridge Skin Impressions, CRC Press, Boca Raton (2004). 4. Lee and Gaensleen's, Advances in Fingerprint Technology, 3rdEdition, R.S. Ramotowski (Ed.), CRC Press. Boca Raton (2013)
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Understand questioned documents, principles of handwriting, and tools used in forensic document examination. **CO2:** Compare questioned and standard documents using handwriting characteristics, natural variations, and examination of paper, ink, and printed materials. **CO3:** Identify document forgeries, alterations, security documents, and explain the basics of fingerprint science. **CO4:** Apply fingerprint classification systems and methods for development and detection of latent fingerprints. **CO5:** Preserve and analyze fingerprint evidence and other impressions such as footprints, palm prints, and lip prints for forensic identification.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	2	1	2	3	2	-	1	-	1	3	3		2	3	K2, K3, K4
CO2	3	3	2	3	3	2	-	2	-	1	2	3		2	3	K2, K3, K4
CO3	3	2	1	3	2	2	-	1	-	1	3	3		2	3	K3, K4, K5
CO4	2	3	3	3	3	2	-	1	2	2	3	3		2	3	K3, K4, K5
CO5	2	3	3	3	3	3	-	2	2	2	2	3		2	3	K2, K3, K4

High-3 Medium-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: II**		
Course Name	**Crime Scene Management**		**Course Code**	**SCIMCNCS202T**		
Credit Hours	L	T	P	N	Total Credits	3
	3	**0**	**0**	-		
Prerequisites (if any)	Fundamentals of forensic science and elementary knowledge of physics, chemistry and biology					
Course Objectives	**The course objectives are as follows-** 1. Understand the concept, types, and significance of crime scenes. 2. Apply systematic crime scene procedures following legal protocols. 3. Identify, recognize, collect, preserve, and document physical and digital evidence. 4. Utilize modern crime detection devices and technologies. 5. Analyze and reconstruct crime scenes scientifically for investigation and trial purposes.					
Course Content	**Unit 1: Crime Scene:** **(9 Hours)** Crime Scene: Introduction to Crime Scene, Classifications of Crime Scenes (Primary and Secondary, Indoor, Outdoor and Mobile, Macroscopic and Microscopic, other Specific type of Crime Scene), securing and Isolating the Crime Scene, Physical Evidence in Criminal Investigation. Process and protection of crime scene; preservation of crime scene and its evidence. Documentation of the scene – Introduction to photography/ videography and sketching of scene of crime; reconstruction of scene of crime; simulation of crime scene. **Unit II Crime Scene Procedure:** **(9 Hours)** Role of the First Responding Officer (First Officer at the Scene, Recording the Time, Assisting the Victim, Search for and Apprehension of Accused, Securing the Crime Scene), Initial Crime Scene Response, Crime Scene Communication, Legal Implications for Crime Scene Searches. **Unit III: Physical evidence:** **(9 Hours)** Meaning; types; search methods of physical evidence; recognition and recovery of physical evidence; classification and role of physical evidence in criminal investigation and trials, chain of custody, first-responder procedure for isolation; seizure of digital exhibits. Elements of packaging evidence – packing material; sealing of evidence; precautions; general directions of packaging. directions for specific type of exhibits – weapons and tools; hair and fibers; blood and bloodstains; semen; saliva; dust or soil; arson cases and cases of burning; tool marks; ballistics exhibits; glass; paint; questioned documents; latent fingerprints; drug samples; and their preservation and forwarding. Packaging and					

APPROVED ACADEMIC COUNCIL
SAGE University, Indore

	transportation of digital & electronic evidence. **Unit IV Crime Scene Documentation:** **(9 Hours)** Plan of Action, Note Taking, Crime Scene Search, Crime Scene Photography, Types of Cameras, Types of Media, Number of Photographs, Admissibility of Photographs, Videography of the Crime Scene. Sketching the Crime Scene, Information Included in Crime Scene Sketches, Equipment, Types of Sketches, Locating Objects in the Sketch, Admissibility of Sketches, Comparison of Sketching and Photography. Reconstruction of crime scene through sketching methods by triangulation method & coordinate method. **Unit V Crime Detection Devices:** **(9 Hours)** UV, IR, X – rays, their nature and applications, detective dyes, neutron radiography, speed detection device. Tools – basic kits, investigators kits, tool used in mobile laboratory. Digital imaging of crime scene, 3D scanning techniques, Tele forensic technology for crime scene investigation, information, manpower and logistics management of crime scene. Technology innovation in crime scene management. Case studies & report writing of crime scene visits. National and international scenario of crime scene management.
Textbooks	1. Barry A.J. Fisher & David R. Fisher – *Techniques of Crime Scene Investigation*, CRC Press 2. Henry C. Lee & Jerry Labriola – *Crime Scene Investigation*, Academic Press 3. Richard Saferstein – *Criminalistics: An Introduction to Forensic Science*, Pearson 4. James & Nordby – *Forensic Science: An Introduction to Scientific and Investigative Techniques*, CRC Press
References	1. Geberth, V.J. – *Practical Homicide Investigation*, CRC Press 2. Dix & Calaluce – *Practical Forensic Digital Imaging*, CRC Press 3. Ross Gardner – *Practical Crime Scene Processing and Investigation*, CRC Press
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Explain[2] different types of crime scenes and principles of crime scene management. **CO2:** Demonstrate[3] proper crime scene procedures as a first responder. **CO3:** - Identify[3] and classify[3] physical and digital evidence. **CO4:** Reconstruct[4] crime scenes scientifically through approved reconstruction methods. **CO5:** Apply[3] advanced tools and technologies and analyze[4] crime scenes for investigation, reporting, and trial purposes.

SAGE UNIVERSITY APPROVED ACADEMIC COUNCIL
Institute of Sciences SAGE University, Indore
SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	2	-	2	1	2	-	1	-	-	3	3	2	3	3	K2, K3, K4, K5
CO2	2	2	3	2	3	3	-	2	2	2	3	2	2	3	3	K2, K3, K4, K5
CO3	3	3	2	3	2	2	-	1	-	-	3	3	3	3	3	K2, K3, K4, K5
CO4	3	3	3	3	3	2	-	2	1	2	3	3	2	3	3	K2, K3, K4, K5
CO5	3	3	3	3	3	3	-	3	2	3	3	3	3	3	3	K2, K3, K4, K5

High-3 Medium-2 Low-13

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze3 K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

Institute of Sciences ★ SAGE University, Indore ★

SAGE UNIVERSITY INDORE ★ APPROVED ★ ACADEMIC COUNCIL

SAGE UNIVERSITY INDORE APPROVED

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: II**		
Course Name	**Crime Scene Management**		**Course Code**	**SCIMCNCS202P**		
Credit Hours	L	T	P	N	**Total Credits**	3
	0	**0**	**6**	**-**		
Prerequisites (if any)	**Basic Crime Scene Management principles**					
Course Objectives	**The course objectives are as follows: –** 1 Develop hands-on skills in crime scene photography, videography, and sketching. 2 Apply systematic search methods for locating physical evidence. 3 Collect, preserve, package, and forward biological, trace, and digital evidence. 4 Demonstrate proper crime scene security, documentation, and note-taking. 5 Prepare professional crime scene records and case documentation suitable for forensic laboratories and courts.					
List of Practicals	1. Photography of Scene of Crime Using Manual & Digital Camera. 2. Methods for Searching of Physical Evidences at Scene of Crime. 3. Sketching of Outdoor Scene of Crime (Homicide) 4. Sketching of indoor of crime scene (Suicide) 5. Sketching of Outdoor Scene of Crime (Accident) 6. Sketching of Indoor Scene of Crime (Theft) 7. Sketching of indoor scene of crime (Dacoity or Robbery) 8. Sketching of Indoor Scene of Crime (Murder) 9. Sketching of Mobile Scene of Crime (Hit & Run Case) 10. Collection, Packing, Labeling and Forwarding of Physical Evidence from Scene of Crime to Forensic Science Laboratory. 11. Securing and Isolation of Crime Scene 12. Documentation of Crime Scene by Videography 13. Crime Scene Note-Taking and Case Diary Preparation 14. Search Pattern Application at Simulated Crime Scene 15. Collection and Preservation of Biological Evidence 16. Recovery and Preservation of Trace Evidence 17. Recovery and Preservation of Trace Evidence 18. Documentation and Seizure of Digital Evidence at Crime Scene 19. Preparation of Crime Scene Report and Court-Oriented Documentation					
Text Books	1. Henry C. Lee & Jerry Labriola *Crime Scene Investigation*, Academic Press 2. Richard Saferstein *Criminalistics: An Introduction to Forensic Science*, Pearson 3. Ross M. Gardner *Practical Crime Scene Processing and Investigation*, CRC Press					

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL
Institute of Sciences SAGE University, Indore
SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

References	1. Vernon J. Geberth *Practical Homicide Investigation*, CRC Press 2. Dix & Calaluce *Practical Forensic Digital Imaging*, CRC Press 3. DFSS Manuals
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Demonstrate[3] proper crime scene photography and videography techniques using manual and digital cameras. **CO2:** Apply[3] appropriate search patterns and scene security measures for effective recovery of physical evidence **CO3:** Apply[3] procedures to collect, preserve, package, and forward biological, trace, physical, and digital evidence while maintaining the chain of custody. **CO4:** Analyze[4] and reconstruct indoor, outdoor, and mobile crime scenes using standard forensic sketching and reconstruction methods. **CO5:** Analyze[4] crime scenes through notes, case diaries, digital evidence seizure, and reporting for legal purposes.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K1, K2, ..., K6)
CO1	2	2	3	2	3	2	-	2	2	2	3	2	2	3	3	K3, K4, K5
CO2	3	3	3	3	3	3	-	2	2	2	3	3	2	3	3	K3, K4, K5
CO3	3	3	3	3	3	3	-	2	2	3	3	2		3	2	K3, K4
CO4	3	3	3	3	3	2	-	2	1	2	3	2		3	2	K3, K4
CO5	3	3	2	3	3	3	-	3	2	3	3	2		3	2	K3, K4

High-3 **Medium-2** **Low-1**

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

APPROVED ACADEMIC COUNCIL

SAGE UNIVERSITY, INDORE

Institute Name: Institute of Sciences				Department Name: Chemistry		
Recommended Programs: Bachelor of Science in Biotechnology / Forensic Science / CBZ/Microbiology				Semester - II		
Course Name	Chemistry – II	Course Code		SCIMINCH203T		
Credit Hours	L	T	P	N	Total Credits	2
	2	-	-	-		
Prerequisites (if any)	Chemistry –I SCIMINCH102T					
Course Objectives	**The course objectives are as follows:** 1. To introduce the fundamental concepts of chemical energetics, thermodynamics, and thermochemistry. 2. To develop understanding of ionic and chemical equilibrium, free energy changes, and their applications in chemical systems. 3. To provide knowledge of aromatic hydrocarbons, alkyl halides, and aryl halides with emphasis on preparation and reactions. 4. To explain the chemistry of alcohols, phenols, ethers, aldehydes, and ketones through reaction mechanisms and applications. 5. To strengthen problem-solving skills related to energy calculations, equilibrium constants, and functional group transformations.					
urse Content	**CHEMICALENERGETICS, EQUILIBRIA & FUNCTIONAL ORGANIC CHEMISTRY-II** **Unit-1 Chemical Energetics:** Thermodynamics: Definition, system and surroundings, state functions, and basic thermodynamic processes. Laws of Thermodynamics: Zeroth, First, Second and Third laws with simple applications, Thermochemistry: Principles, definitions, exothermic and endothermic reactions, Standard State & Enthalpies: Concept of standard state, standard enthalpy of formation. Energy Calculations: Calculation of bond energy and bond dissociation energy (6 hours) **Unit-II Ionic & Chemical Equilibrium:** Ionic Equilibria: Strong, moderate and weak electrolytes; degree of ionization, factors affecting ionization, ionization constant, Acids, Bases & Salts: Ionization of weak acids and bases, pH scale, common ion effect, salt hydrolysis Buffers & Solubility: Buffer solutions; solubility and solubility product and its applications. Free Energy & Equilibrium: Gibbs free energy change in chemical reactions and thermodynamic derivation of the law of chemical equilibrium. Gibbs Functions: Difference between Gibbs free energy (G) and standard Gibbs free energy (G°). (6 hours) **Unit III Aromatic hydrocarbons:** Preparation (Case benzene): from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid. Reactions: (Case benzene): Electrophilic substitution: nitration, halogenation and sulphonation. Friedel-Craft's reaction (alkylation and acylation) (upto 4 carbons on benzene). Side chain oxidation of alkyl benzenes (upto 4 carbons on benzene). Aryl Halides: Preparation: (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions. Reactions (Chlorobenzene): Aromatic nucleophilic substitution (replacement by –OH group). (6 hours) **Unit-IV Alcohols, Phenols and Ethers:** Alcohols – Preparation: Preparation of 1°, 2° and 3° alcohols using Grignard reagent, ester hydrolysis, and reduction of aldehydes, ketones, carboxylic acids and esters. Alcohols – Reactions: Reactions with sodium and HX (Lucas test), esterification, oxidation using acidic dichromate and concentrated HNO_3, Phenols: Preparation of phenol by diazonium salts; Reimer–Tiemann reaction and Gattermann reaction, Ethers: Preparation and properties of aliphatic and aromatic ethers; chemical reactions of ethers (6 hours)					



SAGE UNIVERSITY, INDORE

	Unit-V Aldehydes and Ketones: Formaldehyde, acetaldehyde, acetone and benzaldehyde. Preparation: Preparation of aldehydes and ketones from acid chlorides and from nitriles. Addition Reactions: Reactions with HCN, alcohols (ROH), Aldol condensation, Cannizzaro's reaction, Wittig reaction, Benzoin condensation. Reduction Reactions: Clemmensen reduction and Wolff–Kishner reduction (6 hours)
Text Books	1. Unified Chemistry by M.M.N. Tandon Shivlal Agarwals 2. Chemistry by Madan, R L S. CHAND & COMPANY LTD.
References	1. Lee, J.D. Concise Inorganic Chemistry ELBS, 1991. 2. Cotton, F.A., Wilkinson, G. &Gaus, P.L. Basic Inorganic Chemistry, 3rd ed., 3. Douglas, B.E., McDaniel, D.H. & Alexander, J.J. Concepts and Models in Inorganic Chemistry, John Wiley & Sons. 4. Huheey, J.E., Keiter, E.A., Keiter, R.L. &Medhi, O.K. Inorganic Chemistry: Principles of Structure and Reactivity, Pearson Education India, 2006.
Course Outcomes	**After successful completion of this course, the students will be able to:** **CO1:** Explain basic principles of thermodynamics, laws of thermodynamics, thermochemistry, and calculate bond and resonance energies. **CO2:** Understand ionic equilibria, pH, buffer solutions, solubility product, and apply equilibrium concepts to chemical systems. **CO3:** Describe preparation methods and reactions of aromatic hydrocarbons, alkyl halides, and aryl halides with appropriate mechanisms. **CO4:** Demonstrate knowledge of preparation and reactions of alcohols, phenols, and ethers. **CO5:** Analyze the chemistry of aldehydes and ketones, including important reactions and reduction methods, for theoretical and practical applications.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, …, K_6)
CO1		2									3					K2
CO2	2		3									1				K2
CO3							2					3				K2
CO4				1							2					K2
CO5					3									2		K3

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By
Dr. Siya Upadhyay

Checked By
Dr. Jagrati Singhal

Approved By
Dr. Sandeep Kumar Verma

SAGE UNIVERSITY INDORE * APPROVED * ACADEMIC COUNCIL

Institute of Sciences * SAGE University, Indore

SAGE UNIVERSITY INDORE * APPROVED * BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

Institute Name: Institute of Sciences				**Department Name: Chemistry**		
Recommended Programs : Bachelor of Science in Biotechnology / Forensic Science / CBZ/Microbiology				**Semester II**		
Course Name	**Chemistry – II**		**Course Code**	**SCIMINCH203P**		
Credit Hours	**L**	**T**	**P**	**N**	**Total Credits**	**2**
	-	-	4	-		
Prerequisites (if any)	Chemistry –I SCIMINCH102P					
Course Objectives	**The course objectives are as follows:** 1. The aim of this course is to make students understand thermodynamic concepts. 2. Apply thermodynamic concepts to the system of variable compositions and equilibrium. 3. Further the course gives better understanding of the aromatic compounds and organic functional groups. 4. Understanding of halogenated hydrocarbons and oxygen containing functional groups. 5. Reactivity patterns of functional groups.					
Course Content	**Practicals** **Section A: Physical Chemistry** 1. Determination of the heat capacity of a calorimeter using water. 2. Determination of enthalpy of neutralization of HCl with NaOH. 3. Determination of enthalpy of ionization of acetic acid. 4. Determination of enthalpy of solution of a salt (KNO_3 or NH_4Cl). 5. Determination of enthalpy of hydration of copper sulphate. 6. Study of ionic equilibria using pH measurements. 7. Measurement of pH of common solutions such as aerated drinks, fruit juices, shampoos, and soaps using a pH meter(use dilute soap and shampoo solutions to protect the glass electrode). 8. Preparation of buffer solutions: (i) Sodium acetate–acetic acid buffer (ii) Ammonium chloride–ammonium hydroxide buffer 9. Measurement of the pH of prepared buffer solutions using a pH meter. **Section B: Organic Chemistry** 1. Detection and identification of alcohols using sodium metal test and Lucas test. 2. Preparation of an ester (esterification reaction) from an alcohol and carboxylic acid. 3. Oxidation of alcohols using acidic dichromate and observation of color change. 4. Preparation of acetanilide 5. Preparation of aspirin (acetylsalicylic acid) 6. Preparation of benzoic acid from benzaldehyde 7. Preparation of dibenzalacetone 8. Preparation of soap by saponification 9. Detection of aldehydes and ketones using 2,4-DNP test. 10. Differentiation between aldehydes and ketones using Tollens' test and Fehling's test. 11. Iodoform test for methyl ketones and ethanol.					

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY INDORE APPROVED BOARD OF STUDIES

SAGE UNIVERSITY, INDORE

Text Books	1. Unified Chemistry by M.M.N. Tandon ShivlalAgarwals 2. Chemistry by Madan, R L S. CHAND & COMPANY LTD.
References	1. Lee, J.D. Concise Inorganic Chemistry ELBS, 1991. 2. Cotton, F.A., Wilkinson, G. &Gaus, P.L. Basic Inorganic Chemistry, 3rd ed., 3. Douglas, B.E., McDaniel, D.H. & Alexander, J.J. Concepts and Models in
Course Outcomes	**On completion of the course, the student will be able to:** CO1-Understand the three laws of thermodynamics. CO2-Understand the importance of ΔU, ΔH, ΔS and ΔG for a chemical change. CO3-Understand the concepts of equilibrium state. CO4-Understand preparation, properties and reactions of haloalkanes, haloarenes and Oxygen containing functional groups. CO5-Use synthetic chemistry, learnt in this course, for functional group transformation.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Knowledge Levels (K_1, K_2, …, K_6)
CO1		2									3					K2
CO2			3									1				K2
CO3							2					3				K2
CO4				1							2					K2
CO5					3									2		K3

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By
Dr. Siya Upadhyay

Checked By
Dr. Jagrati Singhal

Approved By
Dr. Sandeep Kumar Verma

Institute of Sciences * SAGE University, Indore *

SAGE UNIVERSITY INDORE * APPROVED * BOARD OF MANAGEMENT

SAGE UNIVERSITY INDORE * APPROVED * ACADEMIC COUNCIL

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: II**		
Course Name	**Physics- II**		**Course Code**	**SCIMINPH203T**		
Credit Hours	L	T	P	N	**Total Credits**	**2**
	2	**-**	**-**	**-**		
Prerequisites (if any)	Higher Secondary Level Physics.					
Course Objectives	**The course objectives are as follows-** 1.A course on advanced methods of vector algebra. 2.A course on advanced methods of electrostatics and electromagnetic waves. 3.The course aims to demonstrate the utility and limitations of a variety of powerful calculation techniques and to provide a deeper understanding of the E.M. waves. 4.The generality of approaches will be emphasized and illustrative examples from E.M. wave will be given. 5.A course on advanced methods of Electromagnetic wave propagation.					
Course Content	**Unit 1- Vector Analysis** **(6 Hours)** Review of vector algebra (Scalar and Vector product), gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors (statement only). **Unit II- Electrostatics** **(6 Hours)** Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere. **Unit III- Magnetism** **(6 Hours)** Magnetostatics: Biot-Savart's law & its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law. Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility **Unit IV- Electromagnetic Induction** **(6 Hours)** Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field.					

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	Unit V- Maxwell`s equations and Electromagnetic wave propagation (6 Hours) Equation of continuity of current, Displacement current, Maxwell's equations, Energy density in electromagnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves.
Textbooks	1. Electricity and Magnetism, Edward M. Purcell, 1986, McGraw-Hill Education. 2. Electricity and Magnetism, J.H. Fewkes & J. Yarwood. Vol. I, 1991, Oxford Univ. Press. 3. Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
References	1. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole. 2. D.J. Griffiths, Introduction to Electrodynamics, 3rd Edn,1998, Benjamin
Course Outcomes	**At the conclusion of this course the successful student will be able to-** CO1-Electricity and Electrodynamics have the key role in the development of modern technological world. Without electric power and communication facilities, life on earth stands still. CO2-A course in electricity and electrodynamics is thus an essential component of physics programme at graduate level. CO3-This course is expected to provide a sound foundation in Electricity and Electrodynamics. CO4- Students should familiarize with electrical circuits, electrical connections, and storage devices their working etc. which will be quite useful in their daily life. CO5-Theoretical and practical knowledge about signal generating circuits enable the students to identify different communication techniques which will be useful in their daily life and higher studies.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	1					1					1					K_1, K_2
CO2			2							3		1				K_2, K_3
CO3						1						1				K_1, K_2, K_3
CO4				1									1			K_1, K_2
CO5			1											1		K_1, K_3

High-3 Medium-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

Institute of Sciences ★ SAGE University, Indore ★

SAGE UNIVERSITY-INDORE ★ APPROVED ★ ACADEMIC COUNCIL ★

SAGE UNIVERSITY-INDORE ★ APPROVED ★ BOARD OF MANAGEMENT ★

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: II**		
Course Name	**Physics- II**		**Course Code**	**SCIMINPH203P**		
Credit Hours	L	T	P	N	Total Credits	2
	-	-	4	-		
Prerequisites (if any)	Higher Secondary Level Physics.					
Course Objectives	**The course objectives are as follows-** 1. A course on advanced methods of vector algebra. 2. A course on advanced methods of electrostatics and electromagnetic waves. 3. The course aims to demonstrate the utility and limitations of a variety of powerful calculation techniques and to provide a deeper understanding of the E.M. waves. 4. The generality of approaches will be emphasized and illustrative examples from E.M. wave will be given. 5. A course on advanced methods of Electromagnetic wave propagation.					
List of Practicals	1. To use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current and (d) checking electrical fuses. 2. Ballistic Galvanometer: (i) Measurement of charge and current sensitivity (ii) Measurement of CDR (iii) Determine a high resistance by Leakage Method (iv) To determine Self Inductance of a Coil by Rayleigh's Method. 3. Measurement of field strength B and its variation in a Solenoid (Determine dB/dx). 4. To study the Characteristics of a Series RC Circuit. 5. To study the series LCR circuit and determine its (a) Resonant Frequency, (b) Quality Factor 6. To study a parallel LCR circuit and determine its (a) Anti-resonant frequency and(b) Quality factor Q 7. To determine a Low Resistance by Carey Foster's Bridge. 8. To verify the Thevenin and Norton theorem 9. To verify the Superposition, and Maximum Power Transfer Theorem.					
Textbooks	1. Advanced Practical Physics for students, B.L. Flint & H.T. Worsnop, 1971, Asia Publishing House. 2. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.					
References	1. Engineering Practical Physics, S. Panigrahi & B. Mallick,2015, Cengage Learning India Pvt. Ltd. 3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers					

Institute of Sciences SAGE University, Indore
SAGE UNIVERSITY-INDORE APPROVED ACADEMIC COUNCIL
SAGE UNIVERSITY-INDORE APPROVED

SAGE UNIVERSITY, INDORE

Course Outcomes	**At the conclusion of this course the successful student will be able to:** CO1-Electricity and Electrodynamics have the key role in the development of modern technological world. Without electric power and communication facilities, life on earth stands still. CO2-A course in electricity and electrodynamics is thus an essential component of physics programme at graduate level. CO3-This course is expected to provide a sound foundation in Electricity and Electrodynamics. CO4- Students should familiarize with electrical circuits, electrical connections, and storage devices their working etc. which will be quite useful in their daily life. CO5-Theoretical and practical knowledge about signal generating circuits enable the students to identify different communication techniques which will be useful in their daily life and higher studies.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	1														1	K_1, K_2, K_3
CO2			2							1		3				K_2, K_3
CO3	1					2								1		K_2, K_3
CO4				3			1						2			K_1, K_2
CO5			1						1					1		K_1, K_3

High-3 Medium-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma

Institute of Sciences * SAGE University, Indore *

SAGE UNIVERSITY INDORE * APPROVED * ACADEMIC COUNCIL *

SAGE UNIVERSITY INDORE * APPROVED * BOARD OF MANAGEMENT *

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			Department Name: Forensic Science			
Recommended Programs: Bachelor of Science in Forensic Science				Semester: II		
Course Name	Zoology - II		Course Code	SCIMINZO203T		
Credit Hours	L	T	P	N	Total Credits	2
	2	0	0	-		
Prerequisites (if any)	Basic understanding of biology and zoology					
Course Objectives	**The course objectives are as follows-** 1. To understand Mendelian and non-Mendelian patterns of inheritance and their relevance in heredity and variation. 2. To illustrate the mechanisms and significance of multiple alleles, sex determination systems, and sex-linked traits in humans and model organisms. 3. To recognize the structural and numerical chromosomal abnormalities and their clinical and developmental implications. 4. To correlate the role of parasites, vectors, and microbes in disease transmission and evaluate basic diagnostic techniques used in clinical settings.					
Course Content	**Unit 1: Mendelian & Non-Mendelian Genetics (6 Hours)** Mendelian genetics: monohybrid/dihybrid crosses, Laws of Inheritance (Segregation, Independent Assortment), test/back crosses, Gene interactions: epistasis, lethal genes in Mus musculus, Types of Dominance **Unit II Multiple Alleles, Sex Determination & Sex-Linked Traits (6 Hours)** Multiple alleles: ABO blood system, Rh, erythroblastosis fetalis Sex determination (XX–XY, XX–XO, ZZ–ZW), Parthenogenesis, Gynandromorphism, Sex-linked traits, hemophilia, color blindness, hypertrichosis. **Unit III: Chromosomes & Aberrations (6 Hours)** Chromosome morphology, chromatin types, Special chromosomes: polytene, lamp-brush Structural and numerical aberrations. **Unit IV: Introduction to Medical Zoology & Epidemic Diseases (6 Hours)** Definitions: parasite, host, vector, zoonosis, branches (protozoology, helminthology, entomology) Epidemics: typhoid, cholera, smallpox **Unit V: Vector-Borne & Microbial Diseases; Clinical Investigations (6 Hours)** Vector-borne diseases: dengue, chikungunya, influenza, scabies, Microbial diseases: tuberculosis, hepatitis, AIDS, Clinical techniques: angiography, angioplasty, dialysis, blood pressure measurement.					

Institute of Sciences ★ SAGE University, Indore ★

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

SAGE UNIVERSITY INDORE APPROVED BOARD OF

SAGE UNIVERSITY, INDORE

Textbooks	1. Verma, P.S. and Agarwal, V.K. (2019). Genetics. S. Chand & Company Ltd., New Delhi. 2. Singh, B.D. (2022). Fundamentals of Genetics. Kalyani Publishers, New Delhi. 3. Park, K. (2023). Preventive and Social Medicine. Banarsidas Bhanot Publishers, Jabalpur.
References	1. Gardner, E.J., Simmons, M.J. and Snustad, D.P. (2006). Principles of Genetics. John Wiley and Sons, Inc., USA. 2. Gupta, P.K. (2020). Genetics: Classical to Modern. Rastogi Publications, Meerut. 3. Chatterjee, K.D. (2018). Parasitology: Protozoology and Helminthology in Relation to Clinical Medicine. CBS Publishers & Distributors, New Delhi.
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Student will be able to apply Mendelian genetic principles to predict outcomes of genetic crosses, interpret pedigrees and understand the basics of genetic inheritance **CO2:** To analyze patterns of inheritance (Mendelian, non-Mendelian, multiple alleles, and sex-linked traits) and interpret pedigree charts to determine genetic transmission mechanisms. **CO3:** Student will be able to evaluate chromosomal aberrations—structural and numerical—by examining chromosomal images; justify their potential phenotypic or clinical impacts **CO4:** Student will be able to critically evaluate control strategies for epidemic, vector-borne, and microbial diseases; assess their effectiveness and recommend improvements **CO5:** Student will be able to create a comprehensive diagnostic report that integrates findings from multiple clinical techniques

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K1, K2, ..., K6)
CO1	3	3	2	3	2	1	1	2	1	2		3	2	3	2	K1, K2, K3, K4
CO2	3	3	2	3	2	1	1	2	1	2		3	2	3	2	K2, K3, K4, K5
CO3	3	3	2	3	3	2	1	2	1	2		3	2	3	3	K2, K3, K4, K5
CO4	2	3	2	3	2	2	3	2	2	3		2	2	3	2	K2, K3, K4
CO5	2	3	3	2	3	3	1	3	2	3		3	3	3	3	K2, K3, K4, K5

High-3 Medium- 2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: II**		
Course Name	**Zoology- II**		**Course Code**	**SCIMINZ0203P**		
Credit Hours	L	T	P	N	Total Credits	2
	0	**0**	**4**	-		
Prerequisites (if any)	**Knowledge of basic concepts of biology and laboratory tools**					
Course Objectives	**The course objectives are as follows: –** 1. To enable students to explore and differentiate the cellular structure of plant and animal cells through microscopic observation. 2. To provide understanding of the principles and applications of microscopy and micrometry. 3. To train students in classical cytological techniques, including staining and preparation of temporary and permanent slides. 4. To develop skills for identifying and analysing stages of cell division and cellular components using staining and imaging techniques.					
List of Practicals	1. Experiments on monohybrid, dihybrid cross ratio and deducing the applicability of Mendelian laws (three examples of each ratio). 2. Experiments on test cross and back cross ratio and deducing the applicability of Mendelian laws (three examples of each ratio). 3. Experiment in multiple alleles, co dominance and epistatic interaction. 4. Study of chromosomal aberrations by use of pictures. 5. Study of Mendelian genetic traits in human beings (tongue rolling, widow's peak, attachment of ear lobes and PTC tasters / non-tasters) using collected data from a limited population. 6. Preparation of normal and abnormal human karyotype from picture of metaphase chromosomal spread. 7. Study of colour blind by Isihara chart. 8. Study of blood groups in human. (ABO & Rh). 9. Study of facultative heterochromatin from humans: Barr body (buccal cells) / Drumstick (Neutrophils). 10. Study of polytene chromosomes from Drosophila / Chironomous larva / Housefly 11. Preparation and analysis of pedigree charts for inheritance of genetic disorders such as hemophilia and color blindness. 12. Demonstration of linkage and crossing over using genetic maps and recombination frequency calculations. 13. Identification and study of different stages of meiosis using temporary squash preparations of grasshopper testis or onion flower buds. 14. Estimation of mitotic index from onion root tip cells and interpretation of cell division activity. 15. Study of mutations and genetic disorders through charts, photographs, and case					

Institute of Sciences SAGE University APPROVED ACADEMIC COUNCIL SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	studies (e.g., Down syndrome, Turner syndrome, Klinefelter syndrome). 16. Demonstration of sex-linked inheritance using pedigree analysis of traits such as hemophilia and red-green color blindness. 17. Calculation of genotype and allele frequencies in a population using the Hardy–Weinberg principle.
Text Books	1. Verma, P.S. and Agarwal, V.K. (2022). Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Company Ltd., New Delhi. 2. Deepti Gupta (2020). Cell Biology. Rastogi Publications, Meerut. 3. Powar, C.B. (2021). Cell Biology (Cytology, Biomolecules and Molecular Biology). Himalaya Publishing House, Mumbai.
References	1. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., & Walter, P. (2017). Molecular Biology of the Cell (6th ed.). Garland Science, New York. 2. Lodish, H., Berk, A., Kaiser, C. A., et al. (2021). Molecular Cell Biology (9th ed.). W. H. Freeman & Company. 3. Karp, G. (2019). Cell and Molecular Biology: Concepts and Experiments (8th ed.). Wiley.
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Describe and differentiate structural features of plant and animal cells using microscopy. **CO2:** Demonstrate the use of simple and compound microscopes and apply micrometry techniques for object measurement. **CO3:** Analyze ultrastructural details of cell organelles using electron micrographs or video-based learning. **CO4:** Evaluate the stages of mitosis and meiosis through prepared and temporary squash slides. **CO5:** Design and carry out staining procedures to visualize cell structures such as mitochondria and nuclei.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K1, K2, ..., K6)
CO1	3	2	2	2	2	1	1	2	1	1		3		2	2	K2, K3, K4
CO2	2	3	3	2	3	1	1	2	2	2		3		2	2	K2, K3, K4
CO3	3	3	2	2	3	1	1	2	1	2		3		2	2	K3, K4, K5
CO4	3	3	3	3	2	1	1	2	1	2		3		2	2	K2, K3, K4
CO5	2	3	3	2	3	2	1	2	2	2		3		2	2	K3, K4, K5

High-3 **Medium-2** **Low-1**

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY INDORE * APPROVED * ACADEMIC COUNCIL

Institute of Sciences * SAGE University, Indore

SAGE UNIVERSITY INDORE * APPROVED * BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: II**		
Course Name	**Botany – II**		**Course Code**	**SCIMINBO203T**		
Credit Hours	L	T	P	N	Total Credits	2
	2	**0**	**0**	-		
Prerequisites (if any)	**Basic understanding of biology**					
Course Objectives	**The course objectives are as follows-** 1. To introduce students to the fundamental concepts of plant morphology, focusing on root, stem, leaf, inflorescence, flower, fruit, and seed structures, their modifications, and functions in various plant species. 2. To Explore Plant Organ Modifications: Various modifications in plant organs (roots, stems, leaves, etc.) and understand their adaptive functions in response to environmental conditions, ecological interactions, and plant survival strategies. 3. To develop an understanding of the complex structure of flowers, floral symmetry, and the various types of inflorescences, along with their role in reproduction and pollination strategies. 4. To provide students with practical knowledge of the diverse plant structures through lab work and real-life examples, enabling them to identify and categorize plants based on their morphological traits. 5. To encourage critical thinking about plant adaptations to different environments, linking morphology with ecological and evolutionary perspective					
Course Content	**Unit 1:** **(6 Hours)** **Introduction to Plant Morphology & Root Morphology** – Introduction, Definition; Types of morphology – Descriptive and Interpretative. Importance of Morphology. **Root Morphology** – Definition, Parts of root; Types – Tap root and fibrous/adventitious Modifications of roots – Aerial roots (Hanging roots) with velamen tissue in Epiphytes; Haustoria (sucking) roots in Parasites – Cuscuta, Respiratory roots/ Pneumatophores in Mangrove; Fleshy/Storage roots. Conical, Fusiform, Napiform, and Tuberous roots; Roots modified for Mechanical supports– Stilt, Prop, Climbing, and Clinging roots with examples. Functions of roots. **Unit II** **(6 Hours)** **Stem Morphology & Leaf Morphology** -Definition, Parts of stem – nodes, internodes, buds, types of buds (Apical, Axillary, Accessory Adventitious and Floral). Types of stems – a) Erect–Strong, Weak (Creepers, Trailers and Climbers); b) Prostrate –Procumbent, Decumbent and Diffuse; Modifications of stem – a) Aerial – Phylloclade, Bulbil b) Sub-aerial – Runner, Sucker, Stolon, Offset; c) Underground – Rhizome, Corm, Tuber, Bulb (Tunicate and Scaly). Functions of stem. Definition, Parts of leaf; Stipule, Petiole, Leaf margins, Apices and Base, Surface, Venation, Phyllotaxy, Leaf duration (Caducous, Deciduous, Persistent- Evergreen). Types of					

APPROVED ACADEMIC COUNCIL
SAGE University, Indore
APPROVED BOARD OF MANAGEMENT

	leaves – Simple and Compound – Pinnately (Unipennate – Paripinnate and Imparipinnate; Bipinnate, Tripinnate and Decompound) and Palmately (Uni-, Bi-, Tri-, Quadri- and Multifoliate); Leaf Modifications: Tendrils **Unit III:** **(6 Hours)** **Lichen –** Definition, general characters of Lichen with suitable examples -crustose, foliose and fruticose, Types of lichen, Economic importance of lichens, Food and beverages, Medicine, Cosmetics, Dyes and Pigments, Environmental monitoring, Bioremediation. **Unit IV** **(6 Hours)** **Morphology of Inflorescence & Morphology of Flower** Definition, Parts of Inflorescence. Types of Inflorescences – a) Racemose –i) Main Axis Elongated – Raceme, Spike, Catkin, Spadix; ii) Main Axis Shortened – Umbel and Corymb; iii) Main Axis Flattened – Capitate, Head / Capitulum; b) Cymose –Solitary, axillary, Terminal, Uniparous (Monochasial) – Helicoid and Scorpioid, Biparous (Dichasial), Multiparous (Polychasial) Cyme; c) Special Type – Verticilliaster, Cyathium, Hypanthodium. Definition, typical structure of flower. Types of flowers based on Symmetry, Insertion of floral whorls on thalamus. **Unit V:** **(6 Hours)** **Floral whorls** – I) Accessory whorls: Calyx: sepals, number, cohesion, types of calyx; Modifications of calyx – Petaloid, Pappus, Spurred; Corolla: petals, number cohesion, forms of corolla–Polypetalous Regular– Cruciform, Caryophyllous, Rosaceous; Polypetalous irregular – Papilionaceous; Gamopetalous Regular – Tubular, Infundibuliform, Campanulate, Salvar shaped, Rotate; Gamopetalous Irregular – Bilabiate, Personate and Ligulate; Perianth: tepals, number, cohesion, modifications – sepaloid and petaloid tepals. Aestivation– Definition; aestivation in calyx, corolla and perianth; types of aestivations. Floral whorls – II) Necessary /Essential whorls: Androecium: Stamen, Structure of stamen; Cohesion and Adhesion; Gynoecium: Carpel / Pistil; structure of carpel; Types of gynoecium based on carpel number and fusion; Placentation- Definition; types – Marginal, Parietal, Axile, Free central, Basal, superficial. **Morphology of Fruit and Seed Fruit:** Definition and parts of fruit. Types of fruits Seed: Definition, Parts of typical seed. Morphology of Monocot and Dicot seeds.
Textbooks	1. Eames, E.J. (1983). Morphology of Vascular Plants. Standard University Press. 2. Gangulee and Kar (2006). College Botany. New Central Book Agency (P.) Ltd. Kolkata. 3. Naik, V.N. (1994). Taxonomy of Angiosperms. Tata McGraw Hill Publishing Comp., New Delhi. 4. Singh, V. and Jain, D.K. (2010). Taxonomy of Angiosperms. Rastogy Publications, Meerut. 5. Singh, V., Pande, P.C., and Jain, D.K. (2011). A Text Book of Botany:

SAGE UNIVERSITY INDORE APPROVED
SAGE University, Indore
APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	Angiosperms. Rastogy Publications, Meerut.
References	1.Plant Systematics by Michael G. Simpson, Elsevier, Academic Press. 2. Plant Systematics – An Integrated approach. Third edition, by Gurucharan Singh, Science Publishers.
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Students will be able to identify, describe, and differentiate between the various types of plant organs (roots, stems, leaves, flowers) and their modifications, based on morphological traits. **CO2:** Students will develop the ability to analyze how specific morphological features of plants such as modified roots, stems, and leaves serve particular ecological functions, enhancing their survival in various habitats. **CO3:** Students will be able to explain the morphology of flowers and inflorescences, including the different types and structures of floral whorls and their roles in the plant's reproductive process. **CO4:** – Students will gain a comprehensive understanding of the morphology of fruits and seeds, enabling them to distinguish between different types and understand their role in seed dispersal and plant reproduction. **CO5:** By the end of the course, students will have the skills to examine plant specimens in the field and laboratory, classifying them based on morphological features and demonstrating an understanding of plant function and evolution.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K1, K2, …, K6)
CO1	3	2	1	2	1	-	2	1	-	1		3		2	2	K1, K2, K3, K4
CO2	3	3	1	3	1	-	3	1	-	1		3		2	2	K2, K3, K4, K5
CO3	3	2	1	2	1	-	1	1	-	1		2		2	2	K2, K3, K4
CO4	3	2	2	2	2	-	2	1	1	1		3		2	2	K2, K3, K4, K5
CO5	3	3	3	3	3	-	2	2	2	2		3		2	3	K2, K3, K4, K5

High-3 **Medium3-2** **Low-1**

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: II**		
Course Name	**Botany - II**		**Course Code**	**SCIMINBO203P**		
Credit Hours	L	T	P	N	Total Credits	2
	0	**0**	**4**	-		
Prerequisites (if any)	**Knowledge of basic concepts of flowers and its parts.**					
Course Objectives	**The course objectives are as follows: –** 1. To provide students with practical knowledge through the study of plant organs such as roots, stems, leaves, flowers, and fruits, enabling them to identify and understand their types, modifications, and functions. 2. To train students to identify and classify various plant species based on their morphological features, including roots, stems, leaves, flowers, and fruits, using examples from common angiosperms. 3. To enhance observational skills through practicals involving the study of floral and fruit morphology, where students will analyze the structure of flowers and fruits in detail. 4. To enable students to explore the diversity of plant forms, modifications, and adaptations in different plant species, enriching their knowledge of plant morphology and ecology. 5. To give students real-world exposure to plant species in their natural habitats, encouraging fieldwork and learning about plant diversity and ecological interactions through an excursion.					
List of Practicals	1. Study of root w.r.t. its types and modifications. 2. Study of stem w.r.t. its types and modifications. 3. Study of leaf w.r.t. its types and modifications. 4. Study of inflorescence 5. Study of typical flower w.r.t. floral whorl calyx (Hibiscus, Datura, Brassica, Glyricidia / Clitoria / Bean, Adhatoda / Ocimum, Polyanthus, Bouganvelia, Citrus, Sunflower, Cucurbita) 6. Study of typical flower w.r.t. floral whorls corolla and perinath, (Hibiscus, Datura, Brassica, Glyricidia / Clitoria / Bean, Adhatoda / Ocimum, Polyanthus, Bouganvelia, Citrus, Sunflower, Cucurbita) 7. Study of typical flower w.r.t. floral whorl- androecium, (Hibiscus, Datura, Brassica, Glyricidia / Clitoria / Bean, Adhatoda / Ocimum, Polyanthus, Bouganvelia, Citrus, Sunflower, Cucurbita) 8. Study of typical flower w.r.t. floral whorl -gynoecium (Hibiscus, Datura, Brassica, Glyricidia / Clitoria / Bean, Adhatoda / Ocimum, Polyanthus, Bouganvelia, Citrus, Sunflower, Cucurbita) 9. Study of types of fruits. 10. Botanical Excursion to nearby locality to explore angiosperms					
	1. 1. Eames, E.J. (1983). Morphology of Vascular Plants. Standard University					

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL
Institute of Sciences SAGE University, Indore
APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

Text Books	Press. 2. Gangulee and Kar (2006). College Botany. New Central Book Agency (P.) Ltd. Kolkata. 3. Naik, V.N. (1994). Taxonomy of Angiosperms. Tata McGraw Hill Publishing Comp., New Delhi. 4. Singh, V. and Jain, D.K. (2010). Taxonomy of Angiosperms. Rastogy Publications. Meerut.
References	1. Plant Systematics by Michael G. Simpson, Elsevier, Academic Press. 2. Plant Systematics – An Integrated approach. Third edition, by Gurucharan Singh, Science Publishers
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** – Students will be able to identify, describe, and differentiate between the various types of plant organs (roots, stems, leaves, flowers) and their modifications, based on morphological traits. **CO2:** Students will develop the ability to analyze how specific morphological features of plants such as modified roots, stems, and leaves serve particular ecological functions, enhancing their survival in various habitats. **CO3:** Students will be able to explain the morphology of flowers and inflorescences, including the different types and structures of floral whorls and their roles in the plant's reproductive process. **CO4:** – Students will gain a comprehensive understanding of the morphology of fruits and seeds, enabling them to distinguish between different types and understand their role in seed dispersal and plant reproduction. **CO5:** Students will have the skills to examine plant specimens in the field and laboratory, classifying them based on morphological features and demonstrating an understanding of plant function and evolution.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K1, K2, ..., K6)
CO1	3	2	1	2	1	-	2	1	-	1		3		2	2	K2, K3, K4
CO2	3	3	1	3	1	-	3	1	-	1		3		2	2	K2, K3, K4
CO3	3	2	1	2	1	-	1	1	-	1		3		2	2	K2, K3, K4
CO4	3	2	2	2	2	-	2	1	1	1		3		2	2	K2, K3, K4, K5
CO5	3	3	3	3	3	1	2	2	2	2		3		2	2	K2, K3, K4, K5

High-3 **Medium-2** **Low-1**

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY, INDORE

Institute Name: Training			Department Name: Training			
Recommended Programs: BA, BDES, BAJMC, BSC, BPA			Semester: II			
Course Name	PROFESSIONAL DEVELOPMENT-II		Course Code	TRNAENPD002P		
Credit Hours	L	T	P	N	Total Credits	2
	0	0	4	0		
					Total Lecture:60	
	PROFESSIONAL DEVELOPMENT-II(P)				0– 0–2	

Course Objectives	• To promote self-discovery and self-awareness by helping students understand their personality, values, strengths, and areas of improvement, while fostering sensitivity towards diversity and inclusion. • To develop effective speaking skills by enabling students to communicate confidently in everyday situations, improve pronunciation, and participate in group interactions and discussions. • To enhance writing skills through structured practice in paragraph writing, informal communication, descriptive writing, and basic note-making and summarization techniques. • To equip students with goal-setting and time management skills by guiding them to set SMART goals, plan actions, manage time effectively, and overcome procrastination. • To build presentation and group communication skills by training students in structuring, designing, and delivering effective presentations with confidence and audience engagement.
Pre-requisites:	Nil

UNIT	CONTENT	HOURS
I	**Self Discovery & Diversity** • Who am I? • Self-concept (factual, emotional, spiritual) • Personality traits • Values, emotions, needs, • Self-esteem and self-efficacy • SWOT analysis • Self-reflection journal • Understanding diversity	10

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL
Institute of Sciences SAGE University, Indore
APPROVED BOARD OF MANAGEMENT

	• Reacting to differences • Assumptions, Bias and Prejudices	
II	**Speaking Skills** • Asking for and giving directions (Practice based) • Expressing opinions and preferences (Practice based) • Speaking in pairs/small groups on familiar topics (Practice based) • Voice Modulation, Intonation & Pitch Control (Practice based) • Phoneme games and pronunciation practice (Practice based) • Basics of Group Discussion	**12**
III	**Writing Skills** • Paragraph development using connectors • Informal letter and email writing • Descriptive and narrative writing • Note-making and summarization basics • Journal entry and diary writing	**10**
IV	**Goal Setting & Time Management** • Meaning and importance of goal setting • Identifying Goals (Short, Medium and Long) • Academic, personal and Professional Goals • SMART Goals & Vision Board • Developing an Action Plan, tracking progress and overcoming obstacles • Importance of time management • Time Audit • Tools and techniques of time management • Procrastination Management	**12**
V	**Presentation Skills** • Introduction to Presentation skills • Structuring the Presentation • Content Development • Designing effective PPTs • Delivery Skills • Engaging the Audience • Group Presentations	**16**

Course Outcomes (as per Bloom's Taxonomy)

At the end of the course the students will be able to:

CO 1	Exhibit self-awareness and respect for diversity by recognizing individual differences, identifying personal strengths and biases, and demonstrating reflective thinking.

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL
SAGE University, Indore
SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

CO 2	. Communicate confidently and clearly in spoken interactions by demonstrating improved pronunciation, voice modulation, and the ability to express opinions and participate in discussions
CO 3	Produce clear, coherent, and well-structured written content such as paragraphs, letters, emails, summaries, and reflective pieces using appropriate language and style
CO 4	. Apply effective goal-setting and time management techniques to plan actions, manage priorities, overcome procrastination, and work toward personal and academic growth.
CO5	Apply presentation skills to structure content, design effective presentations, and deliver engaging individual and group presentations with confidence and clarity.
Text Books:	**Business Communication Today** — *Courtland L. Bovee & John V. Thill* **Soft Skills:** Enhancing Employability — *M. S. Rao* **How to Win Friends and Influence People** — *Dale Carnegie* **Atomic Habits** — *James Clear*
Reference Books:	**The 7 Habits of Highly Effective People** — *Stephen R. Covey* **Talk Like TED** — *Carmine Gallo* **The Power of Habit** — *Charles Duhigg* **Eat That Frog!"** – Brian Tracy

. Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	2					3				3	2				K1,K2
CO2			3						3	3			2		K1,K2
CO3	3					3						2			K1,K2
CO4	3									3	2				K1,K2
CO5		3		3										2	K1,K2

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By:
(Dr Jaya Sharma.)

Checked By:
(Dr. Nitika Vats)

Approved By:
(Dr Sandeep K Verma)

HEAD OF DEPARTMENT
TRAINING

SAGE University, Indore

Institute Name: Institute of Sciences				Department Name:		
Recommended Programs: All UG Program undergoing NEP2020				Semester: II		
Course Name	Introduction to Indian Knowledge System			Course Code	VACVCNIK002N	
Credit Hours	L	T	P	N	Total Credits	2
	0	0	0	4		
Prerequisites (if any)	Not Applicable					

Course Objectives

1. To introduce students to the foundational concepts of the Indian Knowledge System (IKS).
2. To develop understanding of Indian philosophical thought, scientific achievements, and educational heritage.
3. To examine contributions of Indian traditions in disciplines like mathematics, astronomy, linguistics, architecture, medicine, and governance.
4. To promote appreciation of indigenous knowledge and its relevance in the modern context.
5. To encourage interdisciplinary learning by connecting Indian Knowledge System principles with contemporary academic and professional domains.

Course Content

UNIT	Contents
I	**Introduction to Indian Knowledge System** Meaning, sources, and classification of Indian Knowledge System (IKS), Overview of the ancient Indian educational system, Comparison between Gurukul and modern education, Concepts of Dharma, Purushartha, and the Indian value system.
II	**Indian Philosophical Traditions** Introduction to major schools of Indian philosophy, Orthodox systems (Āstika Darshanas): Nyaya, Vaisheshika, Samkhya, Yoga, Mimamsa, Vedanta, Heterodox schools (NāstikaDarshanas): Charvaka, Buddhism, Jainism, Basics of Indian logic and epistemology (Pramana), Concept of knowledge (Jnana) and self (Atman).
III	**Science and Technology in Ancient India** Contributions to mathematics: Aryabhata, Bhaskaracharya, Astronomy: Surya Siddhanta and astronomical advancements, Achievements in metallurgy and town planning (Indus Valley Civilization), Traditional architecture: Temple design and Vastu Shastra principles.
IV	**Indian Knowledge in Language and Literature** Importance of Sanskrit and other classical Indian languages, Grammar and phonetics with reference to Panini's Ashtadhyayi, Indian literary tradition and oral transmission of knowledge. Texts on drama and performing arts: Natya Shastra.
V	**IKS in Practice** Overview of Ayurveda and Yoga, Ethical dimensions in Indian traditions, Indian polity and economic thought: Insights from Kautilya's Arthashastra, Sustainable practices in agriculture and ecology: Vrikshayurveda, Panchagavya.

APPROVED ACADEMIC COUNCIL

SAGE University, Indore

Text Books	**T1:** Kapoor, K. (2022). Textbook of Indian Knowledge System. Central Board of Secondary Education (CBSE). **T2:** Danino, M. (2021). Indian knowledge systems. National Book Trust, India. **T3:** Chattopadhyaya, D. P. (1997). History of science, philosophy and culture in Indian civilization (Vol. 1). Project of History of Indian Science, Philosophy and Culture (PHISPC).
References	**R1:** Malhotra, R. (2016). The battle for Sanskrit: Is Sanskrit political or sacred, oppressive or liberating, dead or alive? HarperCollins Publishers India. **R2:** Balagangadhara, S. N. (1994). The heathen in his blindness: Asia, the West and the dynamic of religion. Brill Academic Publishers. **R3:** Jha, V. N. (2000). Language, logic, and science in India. Centre for Studies in Civilizations (PHISPC).
Course Outcomes	**After successful completion of this course, the student will be able to:** **CO1** Describe the fundamental structure, components, and interdisciplinary nature of the Indian Knowledge System (IKS). **CO2** Appreciate the linguistic, literary, and cultural richness embedded in classical Indian texts and traditions. **CO3** Demonstrate the application of traditional Indian knowledge in contemporary contexts such as wellness, public policy, and environmental sustainability. **CO4** Analyse key philosophical doctrines and schools of thought rooted in Indian intellectual traditions. **CO5** Evaluate the scientific and technological advancements of ancient India and their relevance to modern society.

Mapping of Course Outcomes with Program Outcomes, PSOs, and Knowledge Levels (As per Blooms Taxonomy)

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO4	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3												3		2		K1
CO2					3	3											K3
CO3		3	2								2		3				K3,K5
CO4	2			3												2	K1,K3
CO5			3					1		2	1			3			K3,K4,K5

High-3 Medium-2 Low-1
K_1 =>Remember, K_2 =>Understand, K_3 =>Apply,
K_4 =>Analyze, K_5 =>Evaluate, K_6 =>Create

Designed By
(Dr Paras Dubey)

Checked By
(Dr. Jagrati Singhal)

Approved By
(Dr. Sandeep K Verma)

SAGE University Indore

Institute of Sciences
Forensic Science Department
CHOICE BASED CREDIT SYSTEM (NEP-2020)
PROGRAM STRUCTURE
Effective for Academic Session: 2026-27

Program: Bachelor of Science in Forensic Science
Semester: III
Subject wise Distribution of Marks and Corresponding Credits

Program Code : B Sc [FS]
Admission Batch : 2026-27

S. No.	Subject Code	Category	Subject Title	Maximum Marks Allotted							Hours/week						Credits	Credits Hours
				Theory (100 Marks)			Practical/Studio (100 Marks)			Total Marks								
				End Sem Exam (ESE)	Continuous Internal Evaluation (CIE)		End Sem. Exam (ESE) For Practical and Viva	Continuous Internal Evaluation (CIE)			L	T	P	Studio/ Field Work/ Assignment	S/M	NTCC		
					Mid Sem Test (MST)	Attendance/ Quiz /Assig./ Presentations		Lab Work / WPR	Attendance/Assignment /Viva/Lab Manual									
1	SCIMCNFP301T	MC	Forensic Physics & Ballistics	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
2	SCIMCNFP301P	MC	Forensic Physics & Ballistics	-	-	-	30	10	10	50	0	0	6	-	-	-	3	6
3	SCIMENFP302T/ SCIMENDD302T	ME	Forensic Psychology/ Detection of Deception	60	20	20	-	-	-	100	2	0	0	-	-	-	2	2
4	SCIMENFP302P/ SCIMENDD302P	ME	Forensic Psychology/ Detection of Deception	-	-	-	30	10	10	50	0	0	4	-	-	-	2	4
5	SCIMINCH303T/SCIMINPH303T/SCIMINZO303T/SCIMINBO303T	MI	Chemistry III/Physics III/Zoology III/Botany III	60	20	20	-	-	-	100	2	0	0	-	-	-	2	2
6	SCIMINCH303P/SCIMINPH303P/SCIMINZO303P/SCIMINBO303P	MI	Chemistry III/Physics III/Zoology III/Botany III	-	-	-	30	10	10	50	0	0	4	-	-	-	2	4
7	Multidisciplinary	MD	From University List	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
8	TRNAENPD003P	AE	Professional Development-III	-	-	-	60	20	20	100	-	-	4	-	-	-	2	4
9	VACVCNHY003N	VC	Health, Yoga and Meditation	-	-	-	-	20	30	50	-	-	-	-	-	4	2	4
			TOTAL	**240**	**80**	**80**	**150**	**70**	**80**	**700**	**10**	**0**	**18**	**0**	**0**	**4**	**21**	**32**

Legends		
L= Lecture	1 Hr	1 CR
T= Tutorial	1 Hr	1 CR
P= Practical	2 Hr	1 CR
S= Studio	1 Hr	1.5 CR
N= Non Teaching Credit Course (NTCC)	2 Hr	1 CR
M= MOOC	SWAYAM/NPTEL	Certificate
BM = Blended MOOC	1 Hr	1 CR

NOTE :	
	Weekly Progress Report (WPR) is for NTCC
	Assignment / VIVA for NTCC
	Assignment / VIVA / Lab manual for P

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			Department Name: Forensic Science			
Recommended Programs: Bachelor of Science in Forensic Science			Semester: III			
Course Name	Forensic Physics & Ballistics		Course Code	SCIMCNFP301T		
Credit Hours	L	T	P	N	Total Credits	4
	4	0	0	-		
Prerequisites (if any)	Basic Knowledge of Physics and Ballistics					

Course Objectives

The course objectives are as follows-

1. Understand the principles of physics as they apply to forensic investigations and ballistics analysis.
2. Develop proficiency in the analysis and interpretation of firearm, related evidence
3. Identify and classify different types of firearms, ammunition, and projectiles.
4. Acquire knowledge of the mechanics of firearm operation and the factors influencing bullet trajectories.
5. Apply mathematical calculations and computer simulations to reconstruct shooting incidents

Course Content

UNIT I Introduction to Forensics Physics, Paint & Glass (12 Hours)

Forensic Physics, its scope, significance. Types of paint and their composition, collection and preservation of paint evidence. microscopic analysis of paint pigments, micro chemical analysis solubility test, chemical and instrumental analysis of paint evidence. Types of glass and their composition. Matching and comparison. Forensic examinations of glass fractures, rib marks, hackle marks, cone fracture, wavy, backward fragmentation, concentric and radial fractures. Colour, fluorescence, physical measurements, refractive index, density gradient, becke line, specific gravity examination and elemental analysis of glass evidence.

Unit II Soil, Cement, Concrete and Mortar Examination (12 Hours)

Types and composition of soil, sample preparation, removal of contaminants, colour, molecular particle size distribution, turbidity test, pH measurements, microscopic examination, density gradient analysis, ignition loss test, elemental analysis, interpretation of soil evidence. Cement, Bromoform test, fineness test, ignition loss test. Identification of adulterated cement. Mortar and concrete analysis.

Unit III Ballistics and ammunition: Arms Act Conventional Concepts of firearms (12 Hours)

Classification and characteristics. Features of firearms: Barrel, body, firing pin, Breech face, trigger, cork, and firing mechanism. Caliber, Rifling, purpose of rifling, types of rifling and methods to produce rifling to produce rifling, Bore, Choking & types of choking, Illegal Firearms Techniques of dismantling /

APPROVED ACADEMIC COUNCIL
APPROVED

	assembling of firearm, improvised / country made and their constructional features. Types and classification of ammunition and constructional features of different types of cartridges, types of primers and priming composition, propellants and their compositions, various types of bullet and compositional aspects. **Unit IV Internal Ballistics, External Ballistics & Terminal Ballistics (12 Hours)** Definition, ignition of propellants, shape and size of propellants, various factors affecting the internal ballistics: lock time, ignition time, barrel time, erosion, corrosion and gas cutting, theory of recoil. External Ballistics principal of external ballistics: vacuum trajectory, effect of air resistance on trajectory, Angle of Fall, base, drag, yaw, shape of projectile and stability, coefficient and limiting velocity, Escape velocity & Ricochet. Terminal Ballistics: Effect of projectile on target: function of Bullet shape, striking velocity, striking angle and nature of target, tumbling of bullets, effect of instability of bullet, effect of intermediate targets, Influence of range Cavitations, Temporary and permanent cavities, Ricochet and its effects, stopping power. **Unit V GSR & Wound Ballistics: GSR (12 Hours)** Composition of GSR depending upon propellants & primer mixtures, GSR Distribution, Mechanism of formation of GSR, Location, source and collection of GSR, Analysis of GSR: spot test, chemical test and instrumental technique. Wound Ballistics: Threshold velocity for penetration of skin/flesh/bones, preparation of gel block, penetrative in gel block, nature of wounds of entry, exit, initial with various ranges. postmortem and antemortem firearm injuries. Determination of range of fire, burning, scorching, blackening, tattooing. Different types of marks produced on cartridge, firing pin marks, breech face marks, chamber marks, extractor and ejector marks band on bullet, number/ direction of lands and grooves, striation marks. Introduction to automated system of trajectory computation (Ballistic Data Acquisition system)
Textbooks	1. Henry C. Lee, Howard A. Harris Physical Evidence in Forensic Science 2. B.R. Sharma Forensic Science in Criminal Investigation & Trials 3. B.S. Nabar Forensic Science in Crime Investigation
References	1. CRC Press, New York, 2. Shaw, D; Physics in the Prevention and Detection of Crime, Contem Phys. 3. Saferstein, R; Forensic Science Handbook. Vol. I, II, (Edition), Prentice Hall, New Zealand
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Recall[1] and describe key principles and concepts in forensic physics and ballistics. **CO2:** Analyze[4] firearm, related evidence, such as gunshot residue and tool marks, to support investigative efforts. **CO3:** Identify[3] and classify different types of firearms, ammunition, and

ACADEMIC COUNCIL APPROVED SAGE UNIVERSITY INDORE
Institute of Science SAGE University, Indore
SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	projectiles based on their characteristics. **CO4:** Compare[5] and contrast different firearm models and their operational mechanisms. **CO5:** Classify[2] and interpret bullet trajectories and patterns to reconstruct shooting incidents.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	1	1	1	1			1		1	3	3			2	K2, K3
CO2	2	3	2	3	3	2		1	1	2		3			3	K3, K4
CO3	2	2	1	2	2	1		1		1		3			2	K2, K3
CO4	2	2	1	3	2	1		1		2	2	3				K3, K4
CO5	2	3	3	3	3	2	1	2	1	2	2	3			3	K4, K5

High-3 Medium3-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

Institute of Sciences * SAGE University, Indore *

APPROVED * ACADEMIC COUNCIL * SAGE UNIVERSITY INDORE *

SAGE UNIVERSITY-INDORE * APPROVED * BOARD OF MANAGEMENT *

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: III**		
Course Name	**Forensic Physics & Ballistics**		**Course Code**	**SCIMCNFP301P**		
Credit Hours	L	T	P	N	**Total Credits**	**2**
	0	0	**4**	-		
Prerequisites (if any)	**Strong foundation in physics and understanding of firearms and ammunition.**					
Course Objectives	**The course objectives are as follows: –** 1. Understand the principles of physics as they apply to forensic investigations and ballistics analysis. 2. Develop proficiency in the analysis and interpretation of firearm, related evidence 3. Identify and classify different types of firearms, ammunition, and projectiles. 4. Acquire knowledge of the mechanics of firearm operation and the factors influencing bullet trajectories. 5. Apply mathematical calculations and computer simulations to reconstruct shooting incidents.					
List of Practicals	1. Identification and Classification of Physical Evidence (Class vs Individual characteristics) 2. Collection and preservation of glass evidence 3. Physical Examination of Glass Fragments (Color, thickness, fracture pattern, density gradient column method) 4. Collection and preservation soil evidence 5. Determination of Soil pH and Texture 6. Physical and Microscopic Examination of Soil Samples 7. Collection and preservation of paint evidence & Preliminary Examination of Paint Samples 8. Collection and Preservation of Tool Mark Evidence 9. Casting of Tool Marks & Comparison of Tool Marks 10. Examination of Fracture Match Evidence (Physical matching of broken objects) 11. Collection and preservation of firearm, bullets, cartridge case and GSR 12. Identification and Classification of Ammunition Components (Cartridge case, bullet, primer, propellant) 13. Comparison of Fired Bullets & Comparison of Fired Cartridge Cases 14. Detection of Gunshot Residue (GSR) & Estimation of Firing Distance 15. Determination of Range of Fire (Contact, close, intermediate, distant range) 16. Examination of Bullet Holes in Different Targets (Cloth, wood, glass, metal – simulated)					

SAGE UNIVERSITY, INDORE

	17. Reconstruction of Shooting Scene (Angle of fire, position of shooter and victim
Text Books	**1.** Henry C. Lee, Howard A. Harris Physical Evidence in Forensic Science 2. B.R. Sharma Forensic Science in Criminal Investigation & Trials 3. B.S. Nabar Forensic Science in Crime Investigation
References	1. CRC Press, New York, 2. Shaw, D; Physics in the Prevention and Detection of Crime, Contem Phys. 3. Saferstein, R; Forensic Science Handbook. Vol. I, II, (Edition), Prentice Hall, New
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Apply[3] appropriate techniques for collection, preservation, handling, and documentation of physical, tool mark, glass, soil, paint, and firearm-related evidence following standard forensic protocols. **CO2:** Apply[3] instrumental and laboratory methods such as refractive index determination, density gradient analysis, soil pH analysis, casting of tool marks, and GSR detection for forensic examination of evidence. **CO3:** Analyze[4] and compare[4] glass fragments, soil samples, paint layers, tool marks, fired bullets, and cartridge cases to determine class and individual characteristics. **CO4:** Analyze[4] gunshot patterns, rifling characteristics, bullet defects, and target damage to estimate firing distance, range of fire, and direction of shot. **CO5:** Evaluate[5] ballistic and physical evidence to reconstruct shooting scenes, assess consistency of forensic findings, and support investigative conclusions suitable for courtroom presentation.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO2	2	3	3	2	3	2	1	1	1	2	2	3			3	K2, K3
CO3	2	3	2	3	3	2		2	1	2	3	3			3	K3, K4
CO4	2	3	2	3	3	2		2	1	2	2	3			3	K3, K4
CO5	2	3	3	3	3	3	1	3	2	3	3	3			2	K4, K5

High-3 Medium-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			Department Name: Forensic Science			
Recommended Programs: Bachelor of Science in Forensic Science			Semester: III			
Course Name	Forensic Psychology		Course Code	SCIMENFP302T		
Credit Hours	L	T	P	N	Total Credits	3
	3	0	0	-		
Prerequisites (if any)	Basic knowledge of forensic science, human physiology, psychology, scientific instrumentation, and criminal law related to forensic investigation and evidence.					

Course Objectives

The course objectives are as follows-

1. To understand the principles and role of polygraph and other deception detection techniques in forensic science.
2. To study the physiological and psychological changes associated with deception
3. To learn the concepts, procedures, and applications of brain fingerprinting (BEOS) and narco analysis.
4. To familiarize students with instruments, methods, and interpretation of results in deception detection tests.
5. To understand the legal, ethical considerations, and admissibility of deception detection techniques in India.

Course Content

Unit 1 Basics of Forensic Psychology (9 Hours)

Definition and fundamental concepts of forensic psychology and forensic psychiatry. The role of Forensic Psychology in Civil cases, Criminal cases. Services provided by Forensic Psychologists, Importance of Forensic Psychology in criminal; justice system. Ethical issues in forensic psychology.

Unit II Assessment of Mental Competency (9 Hours)

Mental disorders and forensic psychology. Memory and Eyewitness. Psychology of evidence – eyewitness testimony, confession evidence. Criminal profiling. Psychology in the courtroom, with special reference to Section 84 IPC. Mental Health Act 1987(Objectives, Definitions), Human Rights of Mentally ill person.

Unit III Psychology, Criminal Behavior & Assessment (9 Hours)

Psychopathology and personality disorder. What are Psychological Tests? Intelligence Tests, Achievement Tests, Personality tests, etc. psychological assessment and its importance. Serial murderers. Psychology of terrorism. Biological factors and crime – social learning theories, abuse. Difference between interview and interrogation. Peace model of Interviewing.

Unit IV Juvenile Delinquency (9 Hours)

Juvenile delinquency – theories of offending (social cognition, moral reasoning), Child abuse (physical, sexual, emotional), juvenile sex offenders, legal controversies.







SAGE UNIVERSITY, INDORE

	Unit V Detection of Deception **(9 Hours)** Tools for detection of deception – interviews, non-verbal detection, statement analysis, voice stress analyzer, hypnosis. Polygraphy – operational and question formulation techniques, ethical and legal aspects, the guilty knowledge test. Narco analysis and brain electrical oscillation signatures – principle and theory, ethical and legal issues.
Textbooks	1. Handbook of Forensic Psychology: Dr. Veerraghvan 2. Graham J. Towel & David A. Crighton, Forensic Psychology, BPS Blackwell, Crochane, R.E., Tett, R.P., Vandecreek L. (2003). Psychological Testing and selection of police officers: A National Survey, Criminal Justice System and Behavior 30 (5). 3. Barlow and Durand V.M. (2005) Abnormal Psychology, 6th Edition, New Jersey.
References	1. Clark H.H. & Chase W.G. (1972), on the process of sentences against pictures. Cognitive Psychology 3rd Edition. 2. Underwood WJ (1968), Experimental Psychology: An Introduction, New York. 3. Manuals of Respective Tests.
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Understand and explain the forensic psychology and their application. Important roles in analysis of criminal behaviors. **CO2:** Remember and apply the knowledge of Juvenile offences and their detection for examination. **CO3:** To get the knowledge of forensic psychology in criminal investigation. **CO4:** Apply knowledge by discussing different cases describe the use of psychology to solve the case and know the criminal. **CO5:** Explain the method of lie detection test its process & importance in criminal investigation.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	2	1	2	3	2	-	1	-	1	2	2				K2
CO2	3	3	2	3	3	2	-	2	--	1	2	3				K3, K4
CO3	3	2	1	3	2	2	-	1	-	1	2	3				K3, K4
CO4	2	3	3	3	3	2	-	1	2	2	2	2				K4, K5
CO5	2	3	3	3	3	3	-	2	2	2	2	2				K4, K5

High-3 Medium3-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By
(Ms. Sudhanshi Sharma)

Verified By
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: III**		
Course Name	**Forensic Psychology**		**Course Code**	**SCIMENFP302P**		
Credit Hours	L	T	P	N	**Total Credits**	**1**
	0	0	**2**	-		
Prerequisites (if any)	Basic knowledge of forensic science, human physiology, psychology, scientific instrumentation, and criminal law related to forensic investigation and evidence.					
Course Objectives	**The course objectives are as follows: –** 1. The overview of forensic psychology and its applications. 2. The legal aspects of forensic psychology. 3. The importance of psychological assessment in gauging criminal behavior. 4. The tools and techniques required for detection of deception. 5. The critical assessment of advanced forensic techniques like polygraphy, narco analysis and brain electrical oscillation signatures					
List of Practicals	1. To understand the working of polygraphy test. 2. To prepare a questionnaire for polygraphy test using a case study 3. To understand the working of Psychological Stress Evaluation. 4. To analyze the stress in voice using a recorded voice sample. 5. To understand the brain mapping and its procedure 6. To study the NARCO analysis. 7. To study the cases in which narco analysis was done in India 8. To prepare report about admissibility of Detection of deception tests in India.					
Text Books	1. B.B. Nanda and R.K. Tiwari, Forensic Science in India: A Vision for the Twenty First Century, Select Publishers, New Delhi (2001). 2. M.K. Bhasin and S. Nath, Role of Forensic Science in the New Millennium, University of Delhi, Delhi (2002). 3. S.H. James and J.J. Nordby, Forensic Science: An Introduction to Scientific and Investigative Techniques, 2nd Edition, CRC Press, Boca Raton (2005).					
References	1. W.G. Eckert and R.K. Wright in Introduction to Forensic Sciences, 2nd Edition, W.G. Eckert (ED.), CRC Press, Boca Raton (1997). 2. R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004)					
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** They will learn the use of techniques of deception in forensic science. **CO2:** They will come to know about analysis of physiological changes detected in polygraph. **CO3:** They will learn and understand the working of brain fingerprinting and its utility in India. **CO4:** Students will come to know about narco analysis and its forensic significance **CO5:** They will learn the admissibility of Detection of Deception tests in India.					

SAGE UNIVERSITY, INDORE

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	2	1	2	2	3		1	1	2	2	2		2		K2, K3
CO2	2	3	2	2	3	2		1	1	2	2	2		2		K3, K4
CO3	3	2	2	2	3	2		1	1	2	2	2		2		K2, K3
CO4	2	2	1	2	2	3		1	1	2	2	2		1		K3, K4
CO5	2	1		2	1	3		2	1	3	2	2		1		K4, K5, K6

High-3 Medium-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

Institute of Sciences ★ SAGE University, Indore ★

SAGE UNIVERSITY INDORE ★ ACADEMIC COUNCIL ★ APPROVED

SAGE UNIVERSITY INDORE ★ APPROVED ★ BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			Department Name: Forensic Science			
Recommended Programs: Bachelor of Science in Forensic Science				Semester: III		
Course Name	Detection of Deception		Course Code	SCICMENDD302T		
Credit Hours	L	T	P	N	Total Credits	3
	3	0	0	-		
Prerequisites (if any)	Basic knowledge of forensic science, human physiology, psychology, scientific instrumentation, and criminal law related to forensic investigation and evidence.					

Course Objectives

The course objectives are as follows-

1. To understand the principles and role of polygraph and other deception detection techniques in forensic science.
2. To study the physiological and psychological changes associated with deception
3. To learn the concepts, procedures, and applications of brain fingerprinting (BEOS) and narco analysis.
4. To familiarize students with instruments, methods, and interpretation of results in deception detection tests.
5. To understand the legal, ethical considerations, and admissibility of deception detection techniques in India.

Course Content

Unit 1 Polygraph Test **(9 Hours)**

Polygraph Test: Basic of polygraph, Role of nervous system and polygraph, Physiological changes during deception, Instruments used in polygraph examination, Questionnaire Formulation in Polygraph test, Procedure of Polygraph test, Forensic significance of Polygraph test, Limitations.

Unit II Psychological Stress Evaluation **(9 Hours)**

Theory of stress, Stress and Voice, Components of Voice, Stress theory and lie detection, Similarity between Psychological Stress Evaluator and polygraph, Working principle of Psychological Stress Evaluator, instrumentation and interpretation of Psychological Stress Evaluator. Limitations and advantages, Forensic Significance of PSE test.

Unit III Brain Fingerprinting **(9 Hours)**

Brain fingerprinting or BEOS: History and Introduction, Prerequisites of Brain Fingerprinting, Brain waves, MERMER, equipment, and procedure of brain fingerprinting, result and interpretation of Brain Fingerprinting test, Limitations and advantages, Forensic Significance of Brain Fingerprinting

Unit IV Narco Analysis **(9 Hours)**

Narco analysis History and Introduction, Truth serum, Principle of Narco Analysis, Conscious, sub conscious and unconscious states of mind, requirement, and procedure of Narco analysis. Critical evaluation of Narco analysis.

SAGE University, Indore
SAGE UNIVERSITY-INDORE APPROVED ACADEMIC COUNCIL
SAGE UNIVERSITY-INDORE APPROVED

SAGE UNIVERSITY, INDORE

	Limitations and advantages, Forensic Significance of Brain Fingerprinting test **Unit V Detection of Deception Tests and Legal Considerations (9 Hours)** Deception tests and court, legal considerations of Psychological Stress evaluator, Admissibility of Polygraph in court of law, Admissibility of Brain fingerprinting in court of law, Admissibility of Narco Analysis in court of law
Textbooks	1. B.B. Nanda and R.K. Tiwari, Forensic Science in India: A Vision for the Twenty FirstCentury, Select Publishers, New Delhi (2001). 2. M.K. Bhasin and S. Nath, Role of Forensic Science in the New Millennium, University of Delhi, Delhi (2002). 3. S.H. James and J.J. Nordby, Forensic Science: An Introduction to Scientific and Investigative Techniques, 2nd Edition, CRC Press, Boca Raton (2005).
References	1. W.G. Eckert and R.K. Wright in Introduction to Forensic Sciences, 2nd Edition, W.G. Eckert (ED.), CRC Press, Boca Raton (1997). 2. R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004)
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** They will learn the use of techniques of deception in forensic science **CO2:** They will come to know about analysis of physiological changes detected in polygraph. **CO3:** They will learn and understand the working of brain fingerprinting and its utility in India. **CO4:** Students will come to know about narco analysis and its forensic significance. **CO5:** They will learn the admissibility of Detection of Deception tests in India.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	2	1	2	3	2	-	1	-	1	3	3		3	3	K1, K2, K3, K4
CO2	3	3	2	3	3	2	-	2	--	1	3	3		3	3	K2, K3, K4, K5
CO3	3	2	1	3	2	2	-	1	-	1	3	3		3	3	K2, K3, K4, K5
CO4	2	3	3	3	3	2	-	1	2	2	3	3	2	3	3	K2, K3, K4, K5
CO5	2	3	3	3	3	3	-	2	2	2	3	3	2	3	3	K2, K3, K4, K5

High-3 Medium3-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By
(Ms. Sudhanshi Sharma)

Verified By
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			Department Name: Forensic Science			
Recommended Programs: Bachelor of Science in Forensic Science			Semester: III			
Course Name	Detection of Deception		Course Code	SCICMENDD302P		
Credit Hours	L	T	P	N	Total Credits	1
	0	0	2	-		
Prerequisites (if any)	Basic knowledge of forensic science, human physiology, psychology, scientific instrumentation, and criminal law related to forensic investigation and evidence.					
Course Objectives	**The course objectives are as follows: –** 1. To understand the is the role of Polygraph in detection of Deception. 2. To study physiological changes during deception. 3. To know about Narco analysis and Brain fingerprint. 4. To understand the status of admissibility of Detection of Deception tests in India. 5. To study in which cases latest methods are used and it help them to solve the case.					
List of Practicals	1. To understand the working of polygraphy test. 2. To prepare a questionnaire for polygraphy test using a case study 3. To understand the working of Psychological Stress Evaluation. 4. To analyze the stress in voice using a recorded voice sample. 5. To understand the brain mapping and its procedure 6. To study the NARCO analysis. 7. To study the cases in which narco analysis was done in India 8. To prepare report about admissibility of Detection of deception tests in India.					
Textbooks	1. B.B. Nanda and R.K. Tiwari, Forensic Science in India: A Vision for the Twenty First Century, Select Publishers, New Delhi (2001). 2. M.K. Bhasin and S. Nath, Role of Forensic Science in the New Millennium, University of Delhi, Delhi (2002). 3. S.H. James and J.J. Nordby, Forensic Science: An Introduction to Scientific and Investigative Techniques, 2nd Edition, CRC Press, Boca Raton (2005).					
References	1. W.G. Eckert and R.K. Wright in Introduction to Forensic Sciences, 2nd Edition, W.G. Eckert (ED.), CRC Press, Boca Raton (1997) 2. R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004)					
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** They will learn the use of techniques of deception in forensic science **CO2:** They will come to know about analysis of physiological changes detected in polygraph.					

Institute of Sciences SAGE University, Indore APPROVED ACADEMIC COUNCIL SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	CO3: They will learn and understand the working of brain fingerprinting and its utility in India. **CO4:** Students will come to know about narco analysis and its forensic significance. **CO5:** They will learn the admissibility of Detection of Deception tests in India.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	2	1	2	2	3		1	1	2	2	2		2		K2, K3
CO2	2	3	2	2	3	2		1	1	2	2	2		2		K3, K4
CO3	3	2	2	2	3	2		1	1	2	2	2		2		K2, K3
CO4	2	2	1	2	2	3		1	1	2	2	2		1		K3, K4
CO5	2	1		2	1	3		2	1	3	2	1		1		K4, K5

High-3 Medium3-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By
(Ms. Sudhanshi Sharma)

Verified By
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

Institute of Sciences ★ SAGE University, Indore ★

SAGE UNIVERSITY INDORE ★ APPROVED ★ ACADEMIC COUNCIL ★

SAGE UNIVERSITY INDORE ★ APPROVED ★

SAGE UNIVERSITY, INDORE

Institute Name: Institute of Sciences			Department Name: Chemistry			
Recommended Programs: Bachelor of Science in Biotechnology / Forensic Science / CBZ/Microbiology				Semester – III		
Course Name	Chemistry – III		Course Code	SCIMINCH303T		
Credit Hours	L	T	P	N	Total Credits	3
	3	-	-	-		
Prerequisites (if any)	Chemistry – II SCIMINCH203T					
Course Objectives	**The course objectives are as follows:** 1. The aim of this course is to make students understand phase equilibria, conductance. 2. Application of conductance measurement. 3. Concepts of electrochemical cells and applications of thermodynamics to solutions. 4. The course gives a better understanding of the organic functional groups, which include carboxylic acids and nitrogen containing functional groups. 5. Course and aims to introduce the learner to the fascinating chemistry of some bimolecular,					
Course Content	**SOLUTIONS,PHASEEQUILIBRIUM,CONDUCTANCE,ELECTROCHEMISTRY&FUNCTIONAL GROUP ORGANIC CHEMISTRY-III** **Unit –I Solutions & Phase Equilibrium** Thermodynamics of ideal solutions: Ideal solutions and Raoult'slaw, deviations from Raoult's law – non-ideal solutions. Vapour pressure-composition and temperature- composition curves of ideal and non-ideal solutions. Partial miscibility of liquids: Critical solution temperature; effect of impurity on partial miscibility of liquids Phases, components and degrees of freedom of a system, criteria of phase equilibrium. Gibbs Phase Rule and its thermodynamic derivation. Phase diagrams of one-component systems (water) (6 hours) **Unit –II Electrochemistry & Conductance** **Electrochemistry:** Reversible and irreversible cells. Concept of EMF of a cell. Measurement of EMF of a cell. Nernst equation and its importance. Types of electrodes. Standard electrode potential, Electro chemical series, Concentration cells with transference and without transference. Liquid junction potential and salt bridge. **Conductance:** Conductivity, equivalent and molar conductivity and their variation with dilution for weak and strong electrolytes. Kohlrausch law of independent migration of ions. Transference number and its experimental determination using Hittorf method. Ionic mobility, Potentiometry (6 hours) Unit –III Carboxylic acids and their derivatives Carboxylic acids (aliphatic and aromatic) Preparation: Acidic and Alkaline hydrolysis of esters. Hell–Vohlard-Zelinsky Reaction, Carboxylic acid derivatives (aliphatic); Preparation: Acid chlorides, Anhydrides, Esters and Amides from acids and their interconversion, Reactions: Comparative study of nucleophilicity of acyl derivatives. Reformatsky Reaction, Perkin condensation. (6 hours) **Unit –IV Amines and Diazonium Salts** Amines (Aliphatic and Aromatic) Preparation: from alkyl halides, Gabriel's Phthalimide synthesis, Hofmann Bromamide reaction. Reactions: Hofmann vs. Saytzeff elimination, Carbylamine test, Hinsberg test, with HNO_2, Schotten – Baumann Reaction. Electrophilic substitution (case aniline): nitration, bromination, sulphonation. Diazonium salts: Preparation: from aromatic amines.(6 hours) **UNIT- V Amino Acids and Carbohydrates:** Preparation of Amino Acids: Strecker synthesis using Gabriel's phthalimide synthesis. Zwitterion, Isoelectric point and Electrophoresis, Reactions of Amino acids: ester of –COOH group, acetylation of $-NH_2$ group, complexation with Cu^{2+} ions, ninhydrin test.					

SAGE University, Indore
APPROVED ACADEMIC COUNCIL
APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	Carbohydrates: Classification, and General Properties, Glucose and Fructose (open chain and cyclic structure), Determination of configuration of monosaccharides, absolute configuration of Glucose and Fructose, Mutarotation, ascending and descending in monosaccharides. Structure of disacharrides (sucrose, cellobiose, maltose, lactose) and polysacharrides (starch and cellulose) excluding their structure elucidation. (6 hours)
Text Books	1. Unified Chemistry by M.M.N. Tandon Shivlal Agarwals 2. Chemistry by Madan, R L S. CHAND & COMPANY LTD.
References	1. Barrow, G. Physical Chemistry Tata McGraw-Hill(2007). 2. Castellan, G.W. Physical Chemistry 4th Ed. Narosa(2004). 3. Kotz, J.C., Treichel, P.M. & Townsend, J.R. General Chemistry, Cengage Learning India Pvt. Ltd.: New Delhi(2009). 4. Mahan, B.H.University Chemistry, 3rd Ed. Narosa(1998). 5. Petrucci, R.H. General Chemistry, 5th Ed., Macmillan Publishing Co.: New York(1985).
Course Outcomes	**On completion of the course, the student will be able to:** **CO1**-Understandtheapplicationsofthermodynamicprinciplestosolutions,criticalsolution temperature and Nernst distribution law and its applications. **CO2**-Understand different types of galvanic cells, their Nernst equations, measurement of emf, calculations of thermodynamic properties and other parameters from the emf measurements. **CO3**-Understand preparation, properties and reactions of carboxylic acids and nitrogen containing functionalgroups. **CO4**-Use the synthetic chemistry learnt in this course to do functional group transformations and propose plausible mechanism for any relevantreaction. **CO5**-Understanddemonstratehowstructureofbiomoleculesdeterminestheirreactivity and biological functions.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, …, K_6)
CO1					2							3				K2
CO2									3					1		K2
CO3	1												2			K2
CO4											2					K3
CO5			2											2		K2

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By
Dr. Sarita Chourasia

Checked By
Dr. Jagrati Singhal

Approved By
Dr. Sandeep Kumar Verma

SAGE UNIVERSITY, INDORE

Institute Name: Institute of Sciences			**Department Name: Chemistry**			
Recommended Programs: BBachelor of Science in Biotechnology / Forensic Science / CBZ/Microbiology				**Semester - III**		
Course Name	**Chemistry – III**		**Course Code**	**SCIMINCH303P**		
Credit Hours	L	T	P	N	Total Credits	1
	-	-	2	-		
Prerequisites (if any)	Chemistry – II SCIMINCH203P					
Course Objectives	**The course objectives are as follows:** 1. The aim of this course is to make students understand phase equilibria, conductance. 2. Application of conductance measurement. 3. Concepts of electrochemical cells and applications of thermodynamics to solutions. 4. The course gives a better understanding of the organic functional groups, which include carboxylic acids and nitrogen containing functional groups. 5. Course and aims to introduce the learner to the fascinating chemistry of some bimolecular, i.e., amino acids, peptides, proteins, carbohydrates.					
Course Content	**PRACTICALS** **Section A: Physical Chemistry** **Distribution** Study of the equilibrium of one of the following reactions by the distribution method: i. $I_2(aq) + I\text{-}(aq): I^{3-}(aq)$; (ii) $Cu^{2+}(aq) + xNH_2(aq): [Cu(NH_3)x]^{2+}$ **Phase Equilibria** i. Construction of the phase diagram of a binary system (simple eutectic) using cooling curves. **Conductance** i. Determination of cell constant. ii. Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid. iii. Perform the following conductometric titrations: a) Strong acid vs. strong base b) Weak acid vs. strong base **Potentiometry: Perform the following Potentiometric titrations:** i. Strong acid vs. strong base ii. Weak acid vs. strong base iii. Potassium dichromate vs. Mohr's salt **Section B: Organic Chemistry** 1. Systematic Qualitative Organic Analysis of Organic Compounds possessing monofunctional groups (-COOH, phenol, aldehydic, ketonic, amide, nitro, amines) and preparation of one derivative. 2. Separation of amino acids by paper chromatography 3. Differentiation between a reducing and a nonproducing Sugar					
Text Books	1. Unified Chemistry by M.M.N. Tandon 2. Chemistry by Madan, R L S. CHAND & COMPANY LTD.					
References	1. Barrow, G.M. Physical Chemistry Tata McGraw-Hill (2007). 2. Castellan, G.W. Physical Chemistry 4th Ed. Narosa (2004). 3. Kotz, J.C., Treichel, P.M. & Townsend, J.R. General Chemistry Cengage Learning					

SAGE University, Indore
APPROVED
ACADEMIC COUNCIL
SAGE UNIVERSITY INDORE
APPROVED
BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	India Pvt. Ltd., New Delhi(2009). 4. Mahan, B.H. University Chemistry 3rd Ed. Narosa(1998). 5. Petrucci, R.H. General Chemistry 5th Ed. Macmillan Publishing Co.: NY(1985). 6. Cotton, F.A. & Wilkinson, G. Basic Inorganic Chemistry, Wiley. 7. Shriver,D.F.&Atkins,P.W.InorganicChemistry,OxfordUniversityPress
Course Outcomes	**On completion of the course, the student will be able to:** CO1-Understand the applications of thermodynamic principles to solutions,critical solution temperature and Nernst distribution law and its applications. CO2-Understand different types of galvanic cells, their Nernst equations, measurement of emf, calculations of thermodynamic properties and other parameters from the emf measurements. CO3-Understand the concepts of organic analysis of organic compounds containing mono functional groups. CO4-Use the synthetic chemistry learnt in this course to do functional group transformations and propose plausible mechanism for any relevant reaction. CO5-Understand and demonstrate how structure of biomolecules determines their reactivity and biological functions.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Knowledge Levels (K_1, K_2, …, K_6)
CO1	2											3				K2
CO2													2			K2
CO3		3													1	K2
CO4								3				3				K2
CO5													2			K2

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By	Checked By	Approved By
Dr. Sarita Chourasia	Dr. Jagrati Singhal	Dr. Sandeep Kumar Verma

Institute of Sciences * SAGE University, Indore *

SAGE UNIVERSITY-INDORE * APPROVED * BOARD OF MANAGEMENT

SAGE UNIVERSITY-INDORE * APPROVED * ACADEMIC COUNCIL

SAGE University, Indore

Institute Name: Training			**Department Name: Training**			
Recommended Programs: BCA, BBA, B COM, BA, B Des, BJMC, BSc (All), and all NEP UG Programs (Non-Engineering)				**Semester: III**		
Course Name	Professional Development – III		**Course Code**	TRNAENPD306P		
Credit Hours	L	T	P	N	Total Credits	2
	0	0	4	0		
Prerequisites (if any)	**Not Applicable**					
Course Objectives	1. To develop a creative mindset. 2. To enhance foundational proficiency in LSRW. 3. To present confidently and others in basic social and classroom situations 4. To learn and practice the art of Emotional intelligence. 5. To enhance the problem-solving skills and basic mathematical skills.					
Course Content	**Unit I Creativity** **(10 hrs)** • Why Creativity • Ideation techniques • Life - long Creativity-Personality, Motivation and Environment; • Block to creativity • Creative problem solving • Zenga Game • "Six Thinking Hats" Roleplay • Ideation Warm-Up Game **Unit II Integrated Skills** **(16 hrs)** **LSRW** • Listening to workplace conversations (meetings, instructions) • Making short individual presentations • Debate& Speech • Reading comprehension: Reports, memos, proposals • Interpreting Business reports, blogs, analytical texts • Short report writing (observation, progress, status) • Business jargon, resume-related terminology • Vocabulary related to careers, economy, technology **Etiquette** • Workplace Etiquettes • Business Card Etiquettes • Mobile Etiquettes • Internet Etiquettes • Dining Etiquettes **Unit III Developing positive attitude and growth mindset** **(12 hrs)** • Definition of Positive Attitude & Growth Mindset • Fixed Mindset vs. Growth Mindset • Identifying Self-Limiting Beliefs • Overcoming Negative Self-Talk					

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY-INDORE APPROVED ACADEMIC COUNCIL

SAGE UNIVERSITY-INDORE APPROVED BOARD OF MANAGEMENT

	• Techniques for Reframing Challenges into Opportunities • Building a growth mind set • Developing positive habits & behaviours • Positive Habits Tracker **Unit IV EQ & Stress management** **(10 Hrs)** • Understanding and managing emotions • Emotional Intelligence Models • Developing Emotional Intelligence • Understanding stress • Identifying stressors and their impact • Techniques for managing stress • Coping strategies and resilience building • Mindfulness **Unit V Number System-** **(12 hrs)** • Ratio & Proportion • Partnership • Problem on ages • Mixture & Allegation • Calendar
	1. *Dr K. Alex*, "Soft Skills" S Chand Publication 2. Raymond Murphy – *English Grammar in Use (Advanced)* – Cambridge University Press"Practical English Usage" by Michael Swan 3. Michael Swan – *Practical English Usage* – Oxford University Press 4. Aggarwal R.S. "Quantitative Aptitude for Competitive Examinations", New Delhi: S Chand Publication 5. Gupta D.P., Burnwal. "General Quantitative Aptitude for Competitive Exams", New Delhi: Disha Publication
References	1. "Wren and Martin High School English Grammar and Composition" by P.C. Wren and H. Martin, published by S. Chand & Co. 2. "Fast Track Objective Arithmetic" by Rajesh Verma, published by Arihant Publications. 3. "Emily Post's Etiquette, 19th Edition: Manners for Today" by Lizzie Post and Daniel Post Senning, published by William Morrow 4. Hector Garcia and Francesc Miralles "IKIGAI" Hutchinson London 5. Covey Sean,"Seven Habits of Highly Effective Teens", New York.Fireside Publishers.
Course Outcomes	CO1. The students will be able to build their confidence in and present them Professionally. CO2. The students will be able to improve upon their integrated skills. CO3. The students will be able to bridge the language gap vital to their success and will be able to communicate effectively. CO4.They will be able to strongly develop emotional quotient and learn stress management techniques. CO5.Students will be able to improve their Aptitude Skill.

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT
Institute of Sciences SAGE University, Indore
SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3		3								2				K1,K2
CO2				3	3								2		K1,K2
CO3								3	3			2			K1,K2
CO4									3						K1,K2
CO5	3				3						2			2	K1,K2

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By:
(Dr Jaya Sharma.)

Checked By:
(Dr. Nitika Vats)

HEAD OF DEPARTMENT
TRAINING
SAGE UNIVERSITY, INDORE

Approved By:
(Dr Sandeep K Verma)

Institute of Sciences
SAGE University, Indore

SAGE UNIVERSITY INDORE
APPROVED

SAGE University Indore

Institute of Sciences
Forensic Science Department
CHOICE BASED CREDIT SYSTEM (NEP-2020)
PROGRAM STRUCTURE
Effective for Academic Session: 2026-27

Program Code: B Sc [FS]
Admission Batch: 2026-27

Program: Bachelor of Science in Forensic Science
Semester: IV
Subject wise Distribution of Marks and Corresponding Credits

S. No.	Subject Code	Category	Subject Title	Maximum Marks Allotted							Hours/week						Credits	Credits Hours
				Theory (100 Marks)			Practical/Studio (100 Marks)			Total Marks								
				End Sem Exam (ESE)	Continuous Internal Evaluation (CIE)		End Sem. Exam (ESE) For Practical and Viva	Continuous Internal Evaluation (CIE)			L	T	P	Studio/ Field Work/ Assignment	S/M	NTCC		
					Mid Sem Test (MST)	Attendance/ Quiz /Assig./ Presentations		Lab Work / WPR	Attendance/Assignment /Viva/Lab Manual									
1	SCIMCNFM401T	MC	Forensic Medicine and Toxicology	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
2	SCIMCNFM401P	MC	Forensic Medicine and Toxicology	-	-	-	30	10	10	50	0	0	6	-	-	-	3	6
3	SCIMENFA402T/ SCIMENFO402T	ME	Forensic Anthropology /Forensic Odontology	60	20	20	-	-	-	100	2	0	0	-	-	-	2	2
4	SCIMENFA402P/ SCIMENFO402P	ME	Forensic Anthropology /Forensic Odontology	-	-	-	30	10	10	50	0	0	4	-	-	-	2	4
5	SCIMINCH403T/SCIMINPH403T/SCIMINZO403T/SCIMINBO403T	MI	Chemistry IV/Physics IV/Zoology IV/Botany IV	60	20	20	-	-	-	100	2	0	0	-	-	-	2	2
6	SCIMINCH403P/SCIMINPH403P/SCIMINZO403P/SCIMINBO403P	MI	Chemistry IV/Physics IV/Zoology IV/Botany IV	-	-	-	30	10	10	50	0	0	4	-	-	-	2	4
7	SCISENFT404T	SE	Fundamental Tools for Cyber Security	60	20	20	-	-	-	100	3	-	0	-	-	-	3	3
8	TRNAENPD004P	AE	Professional Development-IV	-	-	-	60	20	20	100	-	-	4	-	-	-	2	4
9	SCIDPNMP405N	DP	Micro Project - II	-	-	-	-	20	30	50	-	-	-	-	-	4	2	4
			TOTAL	**240**	**80**	**80**	**150**	**70**	**80**	**700**	**10**	**0**	**18**	**0**	**0**	**4**	**21**	**32**

Legends		
L= Lecture	1 Hr	1 CR
T= Tutorial	1 Hr	1 CR
P= Practical	2 Hr	1 CR
S= Studio	1 Hr	1.5 CR
N= Non Tecahing Credit Course (NTCC)	2 Hr	1 CR
M= MOOC	SWAYAM/NPTEL	Certificate
BM = Blended MOOC	1 Hr	1 CR

NOTE :	
	Weekly Progress Report (WPR) is for NTCC
	Assignment / VIVA for NTCC
	Assignment / VIVA / Lab manual for P

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			Department Name: Forensic Science			
Recommended Programs: Bachelor of Science in Forensic Science			Semester: IV			
Course Name	Forensic Medicine and Toxicology		Course Code	SCIMCNFM401T		
Credit Hours	L	T	P	N	Total Credits	4
	4	0	0	-		
Prerequisites (if any)	Basic understanding of Forensic medicine and toxicology is required					
Course Objectives	1. Define and describe the basic concepts of forensic medicine, legal procedures, and toxicology. 2. Explain medico-legal processes, types of evidence, postmortem changes, and classification of poisons 3. Apply principles of forensic medicine and toxicology in interpreting simple medico-legal and poisoning cases. 4. Analyze different types of injuries, causes of death, and toxicological findings in forensic investigations. 5. Evaluate medico-legal reports and toxicological data for accuracy and relevance in legal contexts.					
Course Content	**Unit I Forensic Medicine, Law & Ethics (12 Hours)** Definition, scope, and importance of Forensic Medicine, Role of forensic expert in criminal justice system, Medical Ethics & Professional Conduct **Legal Procedures**: FIR, dying declaration, medico-legal report (MLC/MLR) Inquest: Police, Magistrate, Coroner's **Indian Legal System**: Structure of courts, Types of evidence (oral, documentary, expert, circumstantial), **Witnesses**: Types, expert witness, hostile witness **Courtroom Procedures**: Oath, examination-in-chief, cross-examination, re-examination; Ethics in autopsy and consent; Documentation & chain of custody **Unit II Forensic Pathology & Death Investigation (12 Hours)** Definition and classification of death, Modes, manners, and causes of death **Postmortem Changes**: Immediate, early, and late changes; Algor mortis, rigor mortis, lividity; Putrefaction, adipocere, mummification **Estimation of Postmortem Interval (PMI)**; **Autopsy**: Types (medico-legal, clinical, virtual autopsy); Autopsy procedure and report writing **Exhumation**: Legal and forensic aspects; **Injuries**: Mechanical injuries (abrasion, contusion, laceration, incised wounds), Ageing of injuries, Medico-legal importance **Firearm Injuries**: Entry/exit wounds, GSR (Gunshot Residue) **Sexual Offences**: Examination of victim and accused, POCSO Act, recent					

	amendments; Sudden death **Unit III Fundamentals of Forensic Toxicology (12 Hours)** Introduction, scope, and significance, History and development (India & global perspective) **Branches of Toxicology**: Clinical, Analytical, Environmental, Forensic; **Forensic Toxicologist**: Duties & responsibilities; **Poisons**: Definition, classification, Types of poisoning (acute, chronic, accidental, suicidal, homicidal); **Toxicokinetic (ADME)**: Absorption, distribution, metabolism, elimination; **Toxicodynamic**: Receptors and mechanism of action; Factors modifying toxicity; Toxicological Report Writing & Interpretation, Forensic toxicology in mass disasters **Unit IV Extraction & Analytical Methods in Toxicology (12 Hours)** **Matrices for toxicological analysis**: Biological (blood, urine, viscera), non-biological samples; Sample Collection, Preservation & Chain of Custody **Extraction Techniques**: Solvent extraction, Steam distillation, Microdiffusion, Dialysis, Dry ashing and wet digestion, Modified Stas-Otto method, Ammonium sulphate method. **Unit V: Applied Toxicology & Poisons: Isolation and identification of poisons from viscera (12 Hours)** Volatile poisons (alcohol, cyanide), non-volatile organic poisons, Metallic poisons (arsenic, lead, mercury), Toxic anions & cations, Plant poisons (Datura, aconite), Animal poisons (snake venom, insect toxins); **Pesticide Toxicology**: Organophosphates, carbamates; **Food Toxicology**: Food adulterants and toxins
Textbooks	1. The Essentials of Forensic Medicine & Toxicology by K.S. Narayan Reddy and O.P. Murty. 2. Textbook of Forensic Medicine and Toxicology by Anil Agrawal.
References	1. Modi JS: medical jurisprudence and Toxicology. 2. Taylor: Medical jurisprudence 3. Parikh CK: Chikitsa Nyaya Shastra Aur Vish Vigyan. 4. Keith Simpsen& Bernard Knight: Forensic Medicine 5. Poison, CJ, DJ Gee, B. Knight: Forensic Medicine 6. Reddy: Forensic Medicine
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Define basic concepts of forensic medicine and toxicology. **CO2:** Explain the principles of death investigation, medico-legal examination, and toxicological processes. **CO3:** Apply knowledge of forensic pathology and toxicology to solve case-based problems related to injuries and poisoning.

Institute of Pharmaceutical Sciences SAGE University, Indore
SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL
SAGE UNIVERSITY INDORE

SAGE UNIVERSITY, INDORE

	CO4: Analyze extraction methods, postmortem findings, and toxicological results for forensic interpretation. **CO5:** Assess medico-legal and toxicology reports and justify conclusions in forensic case scenarios

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	1	1	1	1	1		1		2	2	2				K2, K3
CO2	2	2	2	2	2	2		1	1	2	3	3			2	K3, K4
CO3	2	3	2	3	2	2		2	1	3		3			2	K2, K3
CO4	2	3	3	3	3	2	1	2	1	3	2	3			3	K3, K4
CO5	2	3	2	3	2	3		3	2	3	2	3			3	K4, K5

High-3 Medium3-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: IV**		
Course Name	**Forensic Medicine and Toxicology**		**Course Code**	**SCIMCNFM401P**		
Credit Hours	L	T	P	N	Total Credits	2
	-	-	4	-		
Prerequisites (if any)	**Basic understanding of human anatomy, forensic science, and general toxicology concepts.**					
Course Objectives	**The course objectives are as follows: –** 1. To understand fundamental concepts of forensic medicine and toxicology. 2. To develop skills in medico-legal documentation and evidence handling. 3. To perform basic examination of injuries, postmortem changes, and poisoning cases. 4. To apply simple analytical and extraction techniques in toxicology. 5. To interpret medico-legal and toxicological findings in case-based scenarios.					
List of Practicals	1. To prepare and label a Medico-Legal Case (MLC) report using a given case format. 2. To perform examination and classification of injuries using dummy models/charts. 3. To demonstrate measurement and documentation of wounds (length, breadth, shape). 4. To study postmortem changes using photographs/models (algor, rigor, lividity). 5. To calculate approximate time since death (PMI) using given parameters. 6. To prepare a sample inquest report (police/magistrate format). 7. To demonstrate chain of custody procedure using mock evidence samples. 8. To perform labelling, sealing, and packaging of biological samples (simulated). 9. To identify common poisons based on physical properties (color, odor, form). 10. To perform safe preliminary spot tests (demonstration-based) for poison detection. 11. To demonstrate viscera preservation techniques using mock samples. 12. To study toxic symptoms correlation using case cards (poison					

Institute of Sciences * SAGE University, Indore *

SAGE UNIVERSITY-INDORE * APPROVED * ACADEMIC COUNCIL

SAGE UNIVERSITY-INDORE * APPROVED * BOARD OF MANAGEMENT

	symptoms matching). 13. To perform solvent extraction (using safe substitutes like food dyes) to understand principle. 14. To demonstrate distillation setup (water/ethanol model) for volatile poison concept. 15. To perform paper chromatography (TLC substitute) for separation of compounds. 16. To prepare and interpret a toxicology report from given lab data. 17. To examine and document simulated firearm injury patterns using charts/images. 18. To identify and classify mechanical injuries using specimen images. 19. To analyze a poisoning case study and prepare medico-legal opinion. 20. To observe autopsy procedure (video-based) and prepare structured notes/report.
Text Books	1. The Essentials of Forensic Medicine & Toxicology by K.S. Narayan Reddy and O.P. Murty. 2. Textbook of Forensic Medicine and Toxicology by Anil Agrawal. 3. DFSS Manual: Forensic Toxicology
References	1. Modi JS: medical jurisprudence and Toxicology. 2. Taylor: Medical jurisprudence 3. Parikh CK: Chikitsa Nyaya Shastra Aur Vish Vigyan. 4. Keith Simpsen& Bernard Knight: Forensic Medicine
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO:1** Identify basic forensic tools, samples, and types of medico-legal cases. **CO:2** Explain procedures for injury examination, postmortem changes, and evidence handling. **CO:3** Perform medico-legal documentation, sample handling, and basic toxicological techniques. **CO:4** Analyze injuries, postmortem findings, and poisoning cases using practical data. **CO:5** Evaluate medico-legal reports and toxicological results for case interpretation.



SAGE UNIVERSITY, INDORE

Mapping of course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	2	1	1	2	1		1		2	3	2		1	2	K3, K4
CO2	2	2	2	2	2	3		1	1	2	3	3			2	K3, KK3, K44
CO3	2	3	3	2	3	3	1	2	1	3	2	2			3	K3, K4, K5
CO4	2	3	2	3	2	2		2	1	3	3	3			3	K3, K4, K5
CO5	2	3	2	3	2	3		3	2	3	3	3			2	K4, K5, K6

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

Institute of Sciences ★ SAGE University, Indore ★

SAGE UNIVERSITY-INDORE ★ APPROVED ★ ACADEMIC COUNCIL

SAGE UNIVERSITY-INDORE ★ APPROVED ★ BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			Department Name: Forensic Science			
Recommended Programs: Bachelor of Science in Forensic Science			Semester: IV			
Course Name	Forensic Anthropology		Course Code	SCIMENFA402T		
Credit Hours	L	T	P	N	Total Credits	3
	3	0	0	-		
Prerequisites (if any)	Basic knowledge of human anatomy, osteology, dental anatomy, and forensic science related to human identification and medico-legal investigation.					
Course Objectives	The course objectives are as follows: – 1. To provide knowledge of forensic anthropology and enable identification using human skeletal remains. 2. To develop understanding of Somatoscopic features for personal identification based on external body characteristics. 3. To impart skills in somatometric measurements and use of anthropometric indices for human identification. 4. To introduce techniques of facial reconstruction and superimposition for identifying unknown individuals. 5. To provide knowledge of forensic odontology for age, sex determination and identification in mass disaster cases.					
Course Content	**Unit I: Forensic Anthropology** (9 Hours) Scope of forensic anthropology. Study of human skeleton. Nature, formation, and identification of human bones. Classification of bones. Suture closure and ossification in other bones, Determination of age, sex, stature from skeletal material. Identification of burnt bones. **Unit II: Somatoscopy** (9 Hours) Somatoscopy – observation of hair on head, forehead, eyes, root of nose, nasal bridge, nasal tip, chin, Darwin's tubercle, ear lobes, supra-orbital ridges, physiognomic ear breadth, circumference of head. Scar marks and occupational marks. **Unit III- Somatometry** (9 Hours) Measurements of head, face, nose, cheek, ear, hand and foot, body weight, height. Indices - cephalic index, nasal index, cranial index, upper facial index. Portrait Parle/ Bertillon system. **Unit IV: Facial Reconstruction** (9 Hours) Photo fit/identify kit. Facial superimposition techniques: - Photographic super imposition, video superimposition, Roentgenographic superimposition. Use of Somatoscopic and craniometric methods in reconstruction. Importance of tissue depth in facial reconstruction.					

SAGE University, Indore
APPROVED ACADEMIC COUNCIL
APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	Unit V: Forensic Odontology **(9 Hours)** Dentition pattern. Structure of teeth. Age determination by teeth, Sex Determination by teeth, Role of dental evidence in mass disaster. Disease of teeth and role in personal identification.
Textbooks	1. Rajesh Bardale, A handbook on Principles of Forensic Medicine & Toxicology, 1st edition, JayPee Brothers Medical Publishers, New Delhi (2011). 2. Dr. KS Narayan Reddy, The Essentials of Forensic Medicine & Toxicology, 29th Edition, Hyderabad (2010). 3. Dr. BV Subrahmanyam, Forensic Medicine, Toxicology & Medical Jurisprudence, 1st Edition, CBS Publishers, New Delhi (2008).
References	1. M.Y. Iscan and S.R. Loth, The scope of forensic anthropology in, Introduction to Forensic Sciences, 2nd Ed., W.G. Eckert (Ed.), CRC Press, Boca Raton (1997). 2. D. Ubelaker and H. Scammell, Bones, M. Evans & Co., New York (2000). 3. S. Rhine, Bone Voyage: A Journey in Forensic Anthropology, University of Mexico Press, Mexico (1998).
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Reconstruct and interpret a biological profile (age, sex, stature) using human skeletal remains in forensic anthropology. **CO2:** Observe, analyze, and document somatoscopic features such as facial traits, scars, and occupational marks for personal identification. **CO3:** Measure body parameters and calculate anthropometric indices to assist in human identification using somatometric techniques. **CO4:** Apply facial reconstruction and superimposition techniques for identification of unknown individuals. **CO5:** Examine dental structures and utilize forensic odontology for identification in routine cases and mass disaster situations.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K1, K2, ..., K6)
CO1	s	3	2	3	2	2		2	1	3	3	3			2	K5, K6
CO2	2	3	2	2	2	2		2	1	2	3	2				K3, K5, K6
CO3	2	3	3	2	3	2		1	1	3	2	3		1	2	K4, K2
CO4	2	3	2	3	3	2		2	1	3	3	3		2	2	K4
CO5	2	3	2	3	3	2		2	1	3	3	3			2	K3, K4, K5

High-3 Medium3-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE University, Indore

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: IV**		
Course Name	**Forensic Anthropology**		**Course Code**	**SCIMENFA402P**		
Credit Hours	L	T	P	N	Total Credits	1
	-	-	**2**	-		
Prerequisites (if any)	Basic knowledge of human anatomy, osteology, dental anatomy, and forensic science related to human identification and medico-legal investigation.					
Course Objectives	**The course objectives are as follows: –** 1. To provide knowledge of forensic anthropology and enable identification using human skeletal remains. 2. To develop understanding of somatoscopic features for personal identification based on external body characteristics. 3. To impart skills in somatometric measurements and use of anthropometric indices for human identification. 4. To introduce techniques of facial reconstruction and superimposition for identifying unknown individuals. 5. To provide knowledge of forensic odontology for age, sex determination and identification in mass disaster cases.					
List of Practicals	1. To determine of age from skull and teeth. 2. To determine of sex from skull. 3. To determine sex from pelvis. 4. To study identification and description of bones and their measurements. 5. To investigate the differences between animal and human bones. 6. To perform somatometric measurements on living subjects. 7. To carry out craniometric measurements of human skull. 8. To estimate stature from long bone length. 9. To conduct portrait parley using photo fit identification kit. 10. To identify the age of person through teeth estimation. 11. To perform facial superimposition with the help of photographs. 12. To study the Bertillon system of an individual. 13. To determine race/ancestry from skull characteristics using anthropological features. 14. To examine and classify different types of human teeth for forensic identification. 15. To study occupational and congenital marks for human identification. 16. To estimate age from epiphyseal union in long bones. 17. To study forensic identification in mass disaster cases using skeletal and dental remains.					
Text Books	1. Rajesh Bardale, A handbook on Principles of Forensic Medicine & Toxicology, 1st edition, JayPee Brothers Medical Publishers, New Delhi (2011).					

Institute of Sciences SAGE University, Indore
SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL
SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	2. Dr. KS Narayan Reddy, The Essentials of Forensic Medicine & Toxicology, 29th Edition, Hyderabad (2010). 3. Dr. BV Subrahmanyam, Forensic Medicine, Toxicology & Medical Jurisprudence, 1st Edition, CBS Publishers, New Delhi (2008).
References	1. M.Y. Iscan and S.R. Loth, The scope of forensic anthropology in, Introduction to Forensic Sciences, 2nd Ed., W.G. Eckert (Ed.), CRC Press, Boca Raton (1997). 2. D. Ubelaker and H. Scammell, Bones, M. Evans & Co., New York (2000). 3. S. Rhine, Bone Voyage: A Journey in Forensic Anthropology, University of Mexico Press, Mexico (1998).
Course Outcomes	**At the conclusion of this course the successful student will be able to:** **CO1:** Reconstruct and interpret a biological profile (age, sex, stature) using human skeletal remains in forensic anthropology. **CO2:** Observe, analyze, and document somatoscopic features such as facial traits, scars, and occupational marks for personal identification. **CO3:** Measure body parameters and calculate anthropometric indices to assist in human identification using somatometric techniques. **CO4:** Apply facial reconstruction and superimposition techniques for identification of unknown individuals. **CO5:** Examine dental structures and utilize forensic odontology for identification in routine cases and mass disaster situations.

Mapping of course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, …, K_6)
CO1	3	3	2	3	2	2		2	1	3	3	3			3	K3, k4
CO2	2	3	2	2	2	2		2	1	2	3	3			3	K3, K4
CO3	2	3	3	2	3	2		1	1	3	2	2		1	2	K3, K4
CO4	2	3	2	3	3	2		2	1	3	3	3		2	2	K4, K5
CO5	2	3	2	3	3	2		2	2	3	3	3			2	K3, K4, K5

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			Department Name: Forensic Science			
Recommended Programs: Bachelor of Science in Forensic Science			Semester: IV			
Course Name	Forensic Odontology		Course Code	SCIMENFO402T		
Credit Hours	L	T	P	N	Total Credits	3
	3	0	0	-		
Prerequisites (if any)	Basic knowledge of human anatomy, osteology, dental anatomy, and forensic science related to human identification and medico-legal investigation.					
Course Objectives	**The course objectives are as follows: –** 1. To understand the Importance of Forensic Odontology 2. To examine the dental Identification and its importance in Post Mortem 3. To understand sex determination with the help of teeth as evidence 4. To know the importance of Bite marks in criminal Identification 5. To identify the role of report writing in Dentistry					
Course Content	**Unit I: Introduction to Forensic Odontology** **(9 Hours)** History of Forensic Dentistry, Scope of Forensic Odontology, Basic Structure of tooth Composition of teeth, Types of teeth, Permanent Teeth and Deciduous teeth, Eruption of teeth, Palmer Notation, Universal Numbering of dentition, FDI, Factors & mechanisms of shedding of deciduous teeth **Unit II: Dental identification** **(9 Hours)** Definition, Basis for dental identification, Postmortem changes of oral structures- Postmortem procedures, Different types of dental records: Dental charts, Dental radiographs, Study casts, Denture marking, Photographs, Significance of Dental Records. **Unit III: Sex determination and Age Determination** **(9 Hours)** Sex determination in adults from radiographs, Sex determination in adults from dental and skeletal morphology, Age estimation in adults- Gustafson's method. Age estimation through incremental lines and neonatal lines. Boyde's Method, Stack's Method Abnormalities of teeth number. Dentist's role in mass disasters, Radiological Examination of teeth for age estimation. **Unit IV: Bite mark** **(9 Hours)** Definition and classification, Basis for bite mark investigation, Bite mark appearance, Macroscopic and microscopic ageing of bite marks, Evidence collection from the victim and suspect of bite mark, Analysis and comparison, Animal bite investigation, Difference between human and non-human bite marks.					

Institute of Sciences SAGE University, Indore
SAGE UNIVERSITY-INDORE APPROVED ACADEMIC COUNCIL
SAGE UNIVERSITY-INDORE APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	Unit V: Report Writing and Documentation **(9 Hours)** Principles of report writing, International Organization for Forensic Odontolostomatology (IOFOS) and American Board of Forensic Odontology (ABFO) quality assurance guidelines in evidence collection, preservation, analysis and report writing.
Textbooks	1. David R Senn, Forensic Dentistry, Paul G Stimson (2010)
References	1. Richik Tripathi, Handbook of Forensic Odontology and Medical Jurisprudence (2016) 2. Sandhaya Ramanujam, Medicolegal aspect for the dental profession (2010)
Course Outcomes	**At the conclusion of this course the successful student will be able to:** CO:1 Students will learn about the basic structure of teeth also the importance of dentistry in the field of Forensics CO:2 Students will learn about the Dental Identification CO:3 Understanding Sex determination from dental and skeletal Morphology CO:4 Role of Bite marks and evidence collection from suspect and victim CO:5 Principles of report writing and quality assurance in evidence collection.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	2	1	1	2	1		1	1	2	2	3			2	K2, K3
CO2	2	3	2	2	3	2		2	1	3	3	3		1	2	K3, K4
CO3	2	3	2	3	3	2		2	1	3	3	3			3	K3, K4
CO4	2	3	3	3	3	3		2	2	3	3	3		1	2	K4, K5
CO5	2	2	2	2	2	3		3	2	3	2	2		2	2	K3, K4, K5

High-3 Medium3-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			**Department Name: Forensic Science**			
Recommended Programs: Bachelor of Science in Forensic Science				**Semester: IV**		
Course Name	**Forensic Odontology**		**Course Code**	**SCIMENFO402P**		
Credit Hours	L	T	P	N	Total Credits	1
	-	-	**2**	-		
Prerequisites (if any)	**Basic understanding of human anatomy, forensic science, and general toxicology concepts.**					
Course Objectives	**The course objectives are as follows: –** 1. To understand the Importance of Forensic Odontology 2. To examine the dental Identification and its importance in Post Mortem 3. To understand sex determination with the help of teeth as evidence 4. To know the importance of Bite marks in criminal Identification 5. To identify the role of report writing in Dentistry					
List of Practicals	1. To record Bite Marks by Casting method. 2. To study Dental pathology 3. To examine structural variations in teeth-Human and non-human 4. To study types of teeth and their function 5. To estimate age of a person from eruption sequence 6. To collect and preserve bite marks and to evaluate bite marks 7. To study the photography techniques involved in Bite mark 8. To study the comparison of ante mortem and post mortem dental record. 9. To identify individual teeth using dental morphology and numbering systems. 10. To study dental restorations and prostheses for personal identification. 11. To examine attrition, abrasion, erosion, and dental wear patterns in age estimation. 12. To analyse palatal rugae patterns for human identification. 13. To study methods of DNA collection from teeth in forensic investigations. 14. To compare human and animal bite marks using dental cast analysis. 15. To perform dental charting and notation using standard forensic methods. 16. To study radiographic techniques used in forensic odontology. 17. To investigate the role of forensic odontology in mass disaster victim identification.					
Text Books	1. David R Senn, Forensic Dentistry, Paul G Stimson (2010) 2. Richik Tripathi, Handbook of Forensic Odontology and Medical Jurisprudence (2016)					

Institute of Sciences ★ SAGE University, Indore ★
SAGE UNIVERSITY, INDORE APPROVED ACADEMIC COUNCIL
SAGE UNIVERSITY, INDORE APPROVED BOARD OF STUDIES

SAGE UNIVERSITY, INDORE

References	1. Sandhaya Ramanujam, Medicolegal aspect for the dental profession (2010)
Course Outcomes	**At the conclusion of this course the successful student will be able to:** CO:1 Forensic Dentistry aims to study the basic structure of teeth also the importance of dentistry in the field of Forensics CO:2 Students learn about the Dental Identification CO:3 Aims to understand Sex determination from dental and skeletal Morphology CO:4 Role of Bite marks and evidence collection from suspect and victim CO:5 Principles of report writing and quality assurance in evidence collection

Mapping of course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	2	1	1	2	1		1		2	3	3		1	2	K3, K4
CO2	2	2	2	2	2	3		1	1	2	3	3			3	K3, K4
CO3	2	3	3	2	3	3	1	2	1	3	2	3		1	3	K3, K4
CO4	2	3	2	3	2	2		2	1	3	3	3		2	3	K4, K5
CO5	2	3	2	3	2	3		3	2	3	3	3		1	2	K4, K5, K6

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

SAGE UNIVERSITY, INDORE

Institute Name: Institute of Sciences			Department Name: Chemistry			
Recommended Programs: Bachelor of Science in Biotechnology / Forensic Science / CBZ/Microbiology			Semester – IV			
Course Name	Chemistry – IV		Course Code	SCIMINCH403T		
Credit Hours	L	T	P	N	Total Credits	3
	3	-	-	-		
Prerequisites (if any)	Chemistry – III SCIMINCH303T					

Course Objectives

The course objectives are as follows:

1. Prepare graduates with the skills to critically assess and solve problems requiring the application of chemical principles.
2. Identify several natural and technological occurrences of coordination compounds.
3. To introduce students to coordination compounds, the d and f block elements, kinetics of chemical reaction and states of matter.
4. To introduce students to properties of solid and liquid states
5. Identify several natural and technological occurrences of crystal field theory.

Course Content

TRANSITION METAL, COORDINATION CHEMISTRY, & STATES OF MATTER

Unit –I Transition Elements (3d series)

General group trends with special reference to electronic configuration, variable valency, colour, magnetic and catalytic properties, ability to form complexes and stability of various oxidation states (Latimer diagrams) for Mn, Fe and Cu. Lanthanoids and actinoids: Electronic configurations, oxidation states, colour, magnetic properties, lanthanide contraction, separation of lanthanides (ion exchange method only) (6 hours)

Unit –II Coordination Chemistry

Valence Bond Theory (VBT): Inner and outer orbital complexes of Cr, Fe, Co and Ni (coordination numbers 4 and 6). Structural and stereoisomerism in complexes with coordination numbers 4 and6. Drawbacks of VBT. IUPAC system of nomenclature. Crystal Field Theory

Crystal field effect, octahedral symmetry, Crystal field stabilization energy (CFSE), Crystal field effects for weak and strong fields, Tetrahedral symmetry, Factors affecting the magnitude of D. Spectrochemical series. Comparison of CFSE for O_h and T_d complexes (6 hours)

Unit –III Kinetic Theory of Gases

Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation. Deviation of real gases from ideal behaviour, compressibility factor, causes of deviation. vander Waals equation of state for real gases, Andrews isotherms of CO_2, most probable, average and root mean square velocities (no derivation), Viscosity of gases and effect of temperature and pressure on coefficient of viscosity (qualitative treatment only) (6 hours)

Unit –IV Liquids

Surface tension and its determination using stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only) (6 hours)

Institute of Sciences ★ SAGE University, Indore ★

SAGE UNIVERSITY INDORE APPROVED ★ ACADEMIC COUNCIL ★

APPROVED BOARD OF MANAGEMENT

SAGE UNIVERSITY, INDORE

	Unit –V Solids Forms of solids, Symmetry elements, unit cells, crystal systems, Bravais lattice types and identification of lattice planes, Laws of Crystallography - Law of constancy of interfacial angles, Law of rational indices. Miller indices. X–Ray diffraction by crystals, Bragg'slaw, Defects in crystals.(6 hours)
Text Books	1.Unified Chemistry by M.M.N. Tandon Shivlal Agarwals 2.Chemistry by Madan, R L S. CHAND & COMPANY LTD.
References	1. Barrow, G.M. Physical Chemistry Tata McGraw-Hill(2007). 2. Castellan, G.W. Physical Chemistry 4th Ed. Narosa(2004). 3. Kotz, J.C., Treichel, P.M. & Townsend, J.R. General Chemistry Cengage Learning India Pvt. Ltd., New Delhi(2009). 4. Mahan, B.H. University Chemistry 3rd Ed. Narosa(1998). 5. Petrucci, R.H. General Chemistry 5th Ed. Macmillan Publishing Co.: New York(1985).
Course Outcomes	**On completion of the course, the student will be able to:** CO1-Understand the important properties of transitionmetals. CO2-Understand the structure, bonding and isomerism in various types ofcomplexes. CO3-Understand the kinetic theory of gases and explain real gases. CO4-Understand collision number, collision frequency, collision diameter and mean free path of molecules and viscosity of gases. CO5-Understand the properties of liquids and solid crystals.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Knowledge Levels (K_1, K_2, …, K_6)
CO1	2											3				K2
CO2													2			K2,K3
CO3		3													1	K2
CO4								3				3				K2
CO5													2			K2

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By
Dr. Sarita Chourasia

Checked By
Dr. Jagrati Singhal

Approved By
Dr. Sandeep Kumar Verma

SAGE UNIVERSITY, INDORE

Institute Name: Institute of Sciences			Department Name: Chemistry			
Recommended Programs: Bachelor of Science in Biotechnology / Forensic Science / CBZ/Microbiology			Semester - IV			
Course Name	Chemistry – IV		Course Code	SCIMINCH403P		
Credit Hours	L	T	P	N	Total Credits	1
	-	-	2	-		
Prerequisites (if any)	CHEMISTRY-III SCIMINCH303P					

Course Objectives

The course objectives are as follows:

1. Prepare graduates with the skills to critically assess and solve problems requiring the application of chemical principles.
2. Identify several natural and technological occurrences of coordination compounds.
3. To introduce students to coordination compounds, the d and f block elements, kinetics of chemical reaction and states of matter.
4. Identify several natural and technological occurrences of transition metals.
5. Identify several natural and technological occurrences of crystal field theory.

Course Content

PRACTICALS

Section A: Inorganic Chemistry

1. Estimation of (i) Mg^{2+}, (ii) Zn_4^{2+} by complexometric titrations using EDTA.
2. Estimation of total hardness of a given sample of water by complexometric titration.
3. Gravimetric estimation of nickel using dimethylglyoxime.
4. Synthesis of Potassium trioxalatoferrate(III) trihydrate, $K_3[Fe(C_2O_4)_3]\cdot 3H_2O$
5. Synthesis of Dichlorobis(ethylenediamine)cobalt(III) Complex
6. Synthesis of Tris(oxalato)ferrate(III) ion, $[Fe(ox)_3]^{3-}$
7. Preparation of Tetraamminecopper(II) sulfate monohydrate
8. Preparation of Hexaamminecobalt(III) chloride, $[Co(NH_3)_6]Cl_3$

Section B: Physical Chemistry

1. Surface tension measurement (use of organic solvents excluded).
2. Determination of the surface tension of a liquid or a dilute solution using a stalagmometer.
3. Study of the variation of surface tension of a detergent solution with concentration.
4. Viscosity measurement (use of organic solvents excluded Determination of the relative and absolute viscosity of a liquid or dilute solution using an Ostwald's viscometer.
5. Study of the variation of viscosity of an aqueous solution with concentration of solute.

Text Books

1. Unified Chemistry by M.M.N. Tandon
2. Chemistry by Madan, R L S. CHAND & COMPANY LTD.

References

1. Barrow, G.M. Physical Chemistry Tata McGraw-Hill(2007).
2. Castellan, G.W. Physical Chemistry 4th Ed. Narosa(2004).
3. Kotz, J.C., Treichel, P.M. & Townsend, J.R. General Chemistry Cengage Learning India Pvt. Ltd., New Delhi(2009).
4. Mahan, B.H. University Chemistry 3rd Ed. Narosa(1998).
5. Petrucci, R.H. General Chemistry 5th Ed. Macmillan Publishing Co.: New York(1985).

SAGE UNIVERSITY-INDORE APPROVED ACADEMIC COUNCIL
Institute of Sciences SAGE University, Indore

SAGE UNIVERSITY, INDORE

Course Outcomes	**On completion of the course, the student will be able to:** CO1-Understand the important properties of transition metals. CO2-Understand the structure, bonding in various types of complexes and their applications CO3- Understand themicroanalysis of cations and anions in mixture CO4- Explain the processes taking place in solution and at interfaces CO5-Understand the properties of liquids.

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Knowledge Levels (K_1, K_2, …, K_6)
CO1	2											3				K2
CO2													2			K2
CO3		3													1	K2
CO4								3				3				K2
CO5													2			K2

High-3 **Medium-2** **Low-1**

K_1 =>Remember **K_2 =>Understand** **K_3 =>Apply** **K_4 =>Analyze** **K_5 =>Evaluate** **K_6 =>Create**

Designed By
Dr. Sarita Chourasia

Checked By
Dr. Jagrati Singhal

Approved By
Dr. Sandeep Kumar Verma

Institute of Sciences * SAGE University, Indore *

APPROVED * BOARD OF MANAGEMENT *

APPROVED * ACADEMIC COUNCIL *

SAGE UNIVERSITY, INDORE

Program Code: B Sc [FS]

Institute Name: Institute of Sciences			Department Name: Forensic Science			
Recommended Programs: Bachelor of Science in Forensic Science			Semester: IV			
Course Name	Fundamental Tools for Cyber Security		Course Code	SCISENFT404T		
Credit Hours	L	T	P	N	Total Credits	3
	3	0	0	-		
Prerequisites (if any)	Basic understanding of Forensic medicine and toxicology is required					
Course Objectives	**The course objectives are as follows: –** 1. To introduce students to the fundamentals of cyber security and Digital Forensics. 2. To develop understanding of cybercrimes, threats, and digital evidence handling. 3. To train students in the use of digital forensic and cyber security tools 4. To build awareness of ethical hacking practices and professional ethics 5. To familiarize students with investigation procedures, reporting, and cyber laws					
Course Content	**UNIT- I Basics of Cyber Security & Digital Forensics (9 Hours)** Introduction to Cyber Security, and Digital Forensics, definition and types of cybercrimes: hacking, identity theft, cyber stalking, financial fraud, Cyber threats: malware, ransomware, phishing attacks, Types of digital evidence, Cyber Security Goals: Confidentiality, Integrity, Availability, Types of Digital Forensics Disk, Network, Mobile, Cloud, Basic Threat Intelligence Concepts, Indicators of Compromise (IOC), Indicators of Attack (IOA),Introduction to Cyber Kill Chain (high-level) **UNIT- II Operating System & Evidence Acquisition (9 Hours)** Basics of operating systems (Windows, Linux), Role of Operating Systems in Cyber Forensic Investigation, File Systems: NTFS, FAT, EXT and Their Forensic Importance, Data acquisition methods: Live acquisition, Dead acquisition, Write blockers, Volatile and Non-Volatile Data Collection, System Artifacts Analysis, Windows Artifacts ,Registry basics, Event Logs ,Prefetch files, USB artifacts, Time-based Analysis, MAC timestamps (Modified, Accessed, Created),Basic Command-Line Exposure, Windows: ipconfig, netstat, task list , Linux: ls, PS, history **UNIT- III Digital Forensic Tools (9 Hours)** Introduction to Digital Forensic Tools and Their Role in Investigation, Classification of Forensic Tools (Disk, Memory, Mobile, Email), Disk Imaging and Evidence Acquisition Tools, Forensic Analysis using Autopsy, FTK Imager, File Recovery and Deleted Data Analysis Techniques, Hashing Tools and Data Integrity Verification (MD5, SHA), Password cracking and recovery tools, Foot					

SAGE University, Indore
APPROVED ACADEMIC COUNCIL
APPROVED BOARD OF MANAGEMENT

	printing and reconnaissance techniques. Email & Browser Forensics. Memory Forensics, RAM evidence, Use of Volatility, Timeline Analysis, forensic timeline, Password Cracking Basics, Difference between hashing vs encryption, Brute force vs dictionary attack. **UNIT-IV Ethical Hacking & Ethics Basics (9 Hours)** Introduction to Ethical Hacking, Types of Hackers (White Hat, Black Hat, Grey Hat), Phases of Ethical Hacking (Reconnaissance, Scanning, Exploitation, Reporting), Social Engineering Attacks and Prevention, Security Policies and Risk Management, Cyber Ethics and Professional Responsibility, Code of Conduct for Cyber Security Professionals, Ethical Issues in Cyber Security and Forensics Mapping Ethical Hacking to Forensics, How attacker techniques leave evidence Anti-Forensics Awareness, Log deletion, File wiping Timestamping. **UNIT- V Investigation, Reporting & Legal Aspects (9 Hours)** Introduction to Cyber Crime Investigation, Steps in Digital Forensic Investigation ,Role of Investigator in Digital Forensics, Handling Live vs Dead Systems in Investigation, Digital Forensic Report Writing, legal Admissibility of Electronic Evidence, Presentation Skills for Court Testimony, Cyber Laws in India (IT Act 2000 & Amendments), Incident Response Basics, Detection Containment, Recovery, Chain of Custody ,Sample format or steps, Forensic Report, Executive summary, Findings, Evidence list, Courtroom Awareness, Do's & Don'ts while presenting evidence
Textbooks	1. Digital Forensics and Cyber Crime – Eoghan Casey 2. The Basics of Digital Forensics – John Sammons
References	1. Hacking: The Art of Exploitation – Jon Erickson 2. Cyber Security Essentials – Charles J. Brooks
Course Outcomes	**At the conclusion of this course the successful student will be able to:** CO:1 Understand fundamental concepts of cyber security, cyber threats, and digital forensics. CO:2 Identify, collect, and preserve digital evidence following standard forensic procedures. CO:3 Apply basic forensic tools for evidence acquisition and analysis. CO:4 Analyze system, network, and user artifacts for cyber-crime investigation. CO:5 Prepare forensic reports and demonstrate knowledge of legal and ethical aspects in cyber investigations.

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT
Institute of Sciences SAGE University, Indore
SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

SAGE UNIVERSITY, INDORE

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	3	1	1	1	1	1		1		2		2	3	3		K2, K3
CO2	2	2	2	2	2	2		1	1	2	1	2	3	3	2	K3, K4
CO3	2	3	2	3	2	2		2	1	3		2	3	3	2	K3. K4
CO4	2	3	3	3	3	2	1	2	1	3	1	2	3	3		K3. K4. K5
CO5	2	3	2	3	2	3		3	2	3	2	2	3	3		K4. K5. K6

High-3 Medium3-2 Low-1

K_1 => Remember K_2 => Understand K_3 => Apply K_4 => Analyze K_5 => Evaluate K_6 => Create

Designed By:
(Ms. Sudhanshi Sharma)

Verified By:
(Dr. Jagrati Singhal)

Approved By:
(Dr. Sandeep Kumar Verma)

Institute of Sciences ★ SAGE University, Indore ★

SAGE UNIVERSITY INDORE ★ APPROVED ★ BOARD OF MANAGEMENT

SAGE UNIVERSITY INDORE ★ APPROVED ★ ACADEMIC COUNCIL

SAGE University, Indore

Institute Name: Training			Department Name: Training			
Recommended Programs: BCA, BBA, B COM, BA, B Des, BJMC, BSc (All) and all NEP UG Program (Non-Engineering)			Semester: IV			
Course Name	Professional Development – IV		Course Code	TRNAENPD406P		
Credit Hours	L	T	P	N	Total Credits	2
	0	0	4	0		
Prerequisites (if any)	Not Applicable					
Course Objectives	1. To develop Interpersonal communication skills. 2. To enrich modern and digital vocabulary. 3. To identify problems and develop critical thinking. 4. To develop leadership skills in the students. 5. To enhance the problem-solving skills and basic mathematical skills					

Course Content

Unit I Interpersonal Skills **(12 hrs)**

- Introduction to Basics of interpersonal communication
- Johari Window (Self-awareness through simple exercises)
- Assessing personal communication styles
- Analysis of different ego states
- Activity: Know Me, Show Me activity to understand Self-Awareness
- Assessment to understand interpersonal needs
- I'm OK – You're OK Sorting Game to understand Analysis of Life Positions
- Practice: Group Discussions, Peer Discussion

Unit II Digital Language and Vocabulary Development **(12 hrs)**

- Social media writing: Tone, structure, netiquette
- Grammar for precision and conciseness
- Avoiding jargon and redundancy in writing
- Email follow-ups, thank-you notes
- Vocabulary: Industry-specific terms, abbreviations, hashtags
- Watching motivational TEDx Talk & discuss its insights
- Read interview/article → Write insights post
- Word clouds, social media post creation
- LinkedIn Profiling

Unit III Problem Solving and Critical Thinking **(10 hrs)**

- Identifying problems
- Analyzing causes
- Generating creative solutions
- Making decisions
- Implement solution and create an action plan
- Activity: Rearrange the Story to practice logical sequencing
- Mind Map on a specific topic

Unit IV Leadership Skills & Team Building **(8 hrs)**

SAGE UNIVERSITY BOARD OF MANAGEMENT APPROVED
Institute of Sciences SAGE University, Indore
SAGE UNIVERSITY INDORE ACADEMIC COUNCIL APPROVED

	• Traits of effective leaders (Discussion) • Developing confidence and communication skills • Developing Leadership Skills • Introduction to teamwork • Stages of Team Development • Building Effective Teams • Leadership Situations – What Would You Do? to understand develops decision-making and leadership skills by simulating real-life challenges. • Activity: Lead a small team to finish a project on time. **Unit V Aptitude/Logical Reasoning -III** **(18 hrs)** • **Profit & Loss**-Basic Concept, Miscellaneous problems • **Simple Interest and Compound Interest** - Basic concepts of Simple Interest, Basic concept of Compound Interest, Miscellaneous Problems • **Data Interpretation**- Table Charts, Bar Charts, Pie Charts, Line Charts • **Ranking & Arrangement** - Basic Concepts, Miscellaneous problems • **Time, speed, distance**-Basic Formula Based Questions, Relative Speed Questions, Problem on Trains-Train and Platform Based Questions, Relative Speed Questions, Boat and Stream-Upstream speed, Downstream Speed
Text Books	1. *Dr K. Alex*, "Soft Skills" S Chand Publications 2. **Raymond Murphy** – *English Grammar in Use (Advanced)* – Cambridge University Press" Practical English Usage" by Michael Swan 3. **Michael Swan** – *Practical English Usage* – Oxford University Press 4. Aggarwal R.S. "Quantitative Aptitude for Competitive Examinations", New Delhi: S Chand Publication 5. Gupta D.P., Burnwal. "General Quantitative Aptitude for Competitive Exams", New Delhi: Disha Publication
References	1. "Wren and Martin High School English Grammar and Composition" by P.C. Wren and H. Martin, published by S. Chand & Co. 2. "Fast Track Objective Arithmetic" by Rajesh Verma, published by Arihant Publications. 3. "Emily Post's Etiquette, 19th Edition: Manners for Today" by Lizzie Post and Daniel Post Senning, published by William Morrow 4. *Hector Garcia and Francesc Miralles* "IKIGAI" Hutchinson London 5. *Covey Sean,* "Seven Habits of Highly Effective Teens", New York.Fireside Publishers.
Course Outcomes	CO1. The students will be able to groom their interpersonal skills. CO2. The students will be able to improve upon their language skills, communication skills, group discussion, personality development and confidence level. CO3. The students will be able to bridge the language gap vital to their success and will be able to communicate effectively. CO4. They will be capable to use appropriate vocabulary and expressions to participate in group discussions, express opinions, and narrate personal experiences in spoken communication. CO5. Students will be able to think logically and solve problems analytically. Improved Aptitude Skill will be observed in students.

Institute of Sciences ★ SAGE University, Indore ★
SAGE UNIVERSITY INDORE ★ APPROVED ★ ACADEMIC COUNCIL ★
SAGE UNIVERSITY ★ APPROVED ★ BOARD OF MANAGE

Mapping of Course outcome with Program Outcomes, PSO's, and Knowledge Levels (As per Blooms Taxonomy)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	Knowledge Levels (K_1, K_2, ..., K_6)
CO1	2					3				3	2				K1,K2
CO2			3						3	3			2		K1,K2
CO3	3					3						2			K1,K2
CO4	3									3	2				K1,K2
CO5		3		3										2	K1,K2

High-3 Medium-2 Low-1

K_1 =>Remember K_2 =>Understand K_3 =>Apply K_4 =>Analyze K_5 =>Evaluate K_6 =>Create

Designed By:
(Dr Jaya Sharma.)

16/6/20
Checked By:
(Dr. Nitika Vats)
HEAD OF DEPARTMENT
TRAINING
SAGE UNIVERSITY, INDORE

Approved By:
(Dr Sandeep K Verma)

Institute of Sciences
SAGE University, Indore

APPROVED
BOARD OF MANAGEMENT

APPROVED
ACADEMIC COUNCIL

SAGE University Indore

Institute of Sciences
ForensicScience Department
CHOICE BASED CREDIT SYSTEM (NEP-2020)
PROGRAM STRUCTURE
Effective for Academic Session: 2026-27

Program: Bachelor of Science in Forensic Science
Semester: V

Program Code: B Sc [FS]
Admission Batch: 2026-27

Subject wise Distribution of Marks and Corresponding Credits

S. No.	Subject Code	Category	Subject Title	Maximum Marks Allotted							Hours/week						Credits	Credits Hours
				Theory (100 Marks)			Practical/Studio (100 Marks)			Total Marks								
				End Sem Exam (ESE)	Continuous Internal Evaluation (CIE)		End Sem. Exam (ESE) For Practical and Viva	Continuous Internal Evaluation (CIE)			L	T	P	Studio/ Field Work/ Assignment	S/M	NTCC		
					Mid Sem Test (MST)	Attendance/ Quiz /Assig./ Presentations		Lab Work / WPR	Attendance/Assignment /Viva/Lab Manual									
1	SCIMCNFC501T	MC	Forensic Chemistry and Explosives	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
2	SCIMCNFC501P	MC	Forensic Chemistry and Explosives	-	-	-	30	10	10	50	0	0	6	-	-	-	3	6
3	SCIMENMB502T/ SCIMENDPS02T	ME	Molecular Biology and r DNA Technology /DNA Profiling	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
4	SCIMENMB502P/ SCIMENDPS02P	ME	Molecular Biology and r DNA Technology /DNA Profiling	-	-	-	30	10	10	50	0	0	6	-	-	-	3	6
5	SCIMINCH503T/SCIMINPH503T/SCIMINZO503T/SCIMINBO503T	MI	Chemistry V/Physics V/Zoology V/Botany V	60	20	20	-	-	-	100	2	0	0	-	-	-	2	2
6	SCIMINCH503P/SCIMINPH503P/SCIMINZO503P/SCIMINBO503P	MI	Chemistry V/Physics V/Zoology V/Botany V	-	-	-	30	10	10	50	0	0	4	-	-	-	2	4
7	Multidisciplinary	MD	From University List	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
8	SCISENDSS0ST	SE	Digital and Security Documents	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
9	TRNAENPS506P	AE	Professional Skills-I	-	-	-	60	20	20	100	0	0	4	-	-	-	2	4
10	VACVCNES001N	VC	Environmental Science & Disaster Management	-	-	-	-	20	30	50	0	0	0	-	-	4	2	4
11	SCIDPNIT507N	DP	Internship	-	-	-	-	20	30	50	-	-	-	-	-	4	2	4
			TOTAL	**300**	**100**	**100**	**150**	**90**	**110**	**850**	**14**	**0**	**20**	**0**	**0**	**8**	**28**	**42**

Legends		
L= Lecture	1 Hr	1 CR
T= Tutorial	1 Hr	1 CR
P= Practical	2 Hr	1 CR
S= Studio	1 Hr	1.5 CR
N= Non Tecahing Credit Course (NTCC)	2 Hr	1 CR
M= MOOC	SWAYAM/NPTEL	Certificate

NOTE :	
	Weekly Progress Report (WPR) is for NTCC
	Assignment / VIVA for NTCC
	Assignment / VIVA / Lab manual for P

SAGE UNIVERSITY INDORE ★ APPROVED ★ ACADEMIC COUNCIL

SAGE UNIVERSITY INDORE ★ APPROVED ★ BOARD OF STUDIES

Institute of Science ★ SAGE University, Indore

SAGE University Indore

Institute of Sciences
Forensic Science Department
CHOICE BASED CREDIT SYSTEM (NEP-2020)
PROGRAM STRUCTURE
Effective for Academic Session: 2026-27

Program: Bachelor of Science in Forensic Science
Semester: VI

Program Code: B Sc [FS]
Admission Batch: 2026-27

Subject wise Distribution of Marks and Corresponding Credits

S. No.	Subject Code	Category	Subject Title	Maximum Marks Allotted							Hours/week						Credits	Credits Hours
				Theory (100 Marks)			Practical/Studio (100 Marks)			Total Marks								
				End Sem Exam (ESE)	Continuous Internal Evaluation (CIE)		End Sem. Exam (ESE) For Practical and Viva	Continuous Internal Evaluation (CIE)			L	T	P	Studio/ Field Work/ Assignment	S/M	NTCC		
					Mid Sem Test (MST)	Attendance/ Quiz /Assig./ Presentations		Lab Work / WPR	Attendance/Assignment /Viva/Lab Manual									
1	SCIMCNIT601T	MC	Instrumentation Techniques	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
2	SCIMCNIT601P	MC	Instrumentation Techniques	-	-	-	30	10	10	50	0	0	6	-	-	-	3	6
3	SCIMCNFB602T	MC	Forensic Biology, Forensic Serology and DNA Fingerprinting	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
4	SCIMCNFB602P	MC	Forensic Biology, Forensic Serology and DNA Fingerprinting	-	-	-	30	10	10	50	0	0	6	-	-	-	3	6
5	SCIMENFN603T/ SCIMENAV603T	ME	Forensic Nanotechnology / Audio- Video Forensics	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
6	SCIMENFE603P/ SCIMENFA603P	ME	Forensic Nanotechnology / Audio- Video Forensics	-	-	-	30	10	10	50	0	0	6	-	-	-	3	6
7	SCIMINCH604T/SCIMINPH604T/SCIMINZO604T/SCIMINBO604T	MI	Chemistry VI/Physics VI/Zoology VI/Botany VI	60	20	20	-	-	-	100	2	0	0	-	-	-	2	2
8	SCIMINCH604P/SCIMINPH604P/SCIMINZO604P/SCIMINBO64P	MI	Chemistry VI/Physics VI/Zoology VI/Botany VI	-	-	-	30	10	10	50	0	0	4	-	-	-	2	4
9	TRNAENPS605P	AE	Professional Skills-II	-	-	-	60	20	20	100	0	0	4	-	-	-	2	4
10	VACVCNDT004N	VC	Digital and Technological Solutions	-	-	-	-	20	30	50	0	0	-	-	-	4	2	4
			TOTAL	240	80	80	180	80	90	750	11	0	26	0	0	4	26	41

Legends		
L= Lecture	1 Hr	1 CR
T= Tutorial	1 Hr	1 CR
P= Practical	2 Hr	1 CR
S= Studio	1 Hr	1.5 CR
N= Non Tecahing Credit Course (NTCC)	2 Hr	1 CR
M= MOOC	SWAYAM/NPTEL	Certificate
BM = Blended MOOC	1 Hr	1 CR

NOTE :	
	Weekly Progress Report (WPR) is for NTCC
	Assignment / VIVA for NTCC
	Assignment / VIVA / Lab manual for P

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

Institute of Sciences SAGE University, Indore

SAGE University Indore

Institute of Sciences

Forensic Science Department

CHOICE BASED CREDIT SYSTEM (NEP-2020)

PROGRAM STRUCTURE

Effective for Academic Session: 2026-27

Program: Bachelor of Science in Forensic Science

Semester: VII

Program Code: B Sc [FS]
Admission Batch: 2026-27

Subject wise Distribution of Marks and Corresponding Credits

S. No.	Subject Code	Category	Subject Title	Maximum Marks Allotted							Hours/week						Credits	Credits Hours
				Theory (100 Marks)			Practical/Studio (100 Marks)			Total Marks								
				End Sem Exam (ESE)	Continuous Internal Evaluation (CIE)		End Sem. Exam (ESE) For Practical and Viva	Continuous Internal Evaluation (CIE)			L	T	P	Studio/ Field Work/ Assignment	S/M	NTCC		
					Mid Sem Test (MST)	Attendance/ Quiz /Assig./ Presentations		Lab Work / WPR	Attendance/Assignment /Viva/Lab Manual									
1	SCIMCNFP701T	MC	Forensic Photography and Biometric	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
2	SCIMCNFP701P	MC	Forensic photography and Biometric	-	-	-	30	10	10	50	0	0	6	-	-	-	3	6
3	SCIMCNDF702T	MC	Digital and Cyber Forensic	60	20	20	-	-	-	100	3	0	0	-	-	-	3	3
4	SCIMCNDF702P	MC	Digital and Cyber Forensic	-	-	-	30	10	10	50	0	0	6	-	-	-	3	6
5	SCIMCNRM703T	MC	Research Methadology	60	20	20	-	-	-	100	4	0	0	-	-	-	4	4
6	SCIMINCH704T/SCIMINPH704T/SCIMINZO704T/SCIMINBO704T	MI	Chemistry VII/Physics VII/ZoologyVII/Botany VII	60	20	20	-	-	-	100	2	0	0	-	-	-	2	2
7	SCIMINCH704P/SCIMINPH704P/SCIMINZO704P/SCIMINBO704P	MI	Chemistry VII/Physics VII/ZoologyVII/Botany VII	-	-	-	30	10	10	50	0	0	4	-	-	-	2	4
			TOTAL	**240**	**80**	**80**	**90**	**30**	**30**	**550**	**12**	**0**	**16**	**0**	**0**	**0**	**20**	**28**

Legends		
L= Lecture	1 Hr	1 CR
T= Tutorial	1 Hr	1 CR
P= Practical	2 Hr	1 CR
S= Studio	1 Hr	1.5 CR
N= Non Teaching Credit Course (NTCC)	2 Hr	1 CR
M= MOOC	SWAYAM/NPTEL	Certificate
BM = Blended MOOC	1 Hr	1 CR

NOTE :	
	Weekly Progress Report (WPR) is for NTCC
	Assignment / VIVA for NTCC
	Assignment / VIVA / Lab manual for P

SAGE UNIVERSITY INDORE APPROVED ACADEMIC COUNCIL

SAGE UNIVERSITY INDORE APPROVED BOARD OF MANAGEMENT

Institute of Sciences SAGE University, Indore