

Programme Structure

**School of Allied Health Sciences
Master of Science
(Forensic Science)**

Programme code: SAH0131

Batch: 2023-25



M.Sc. (Forensic Sciences)
Batch: 2023-25
Semester: I

S. No.	Subject Code	Subjects	Teaching Load			Credits	Core/Elective/Pre-Requisite/Co Requisite
			L	T	P		
THEORY SUBJECTS							
1	FSM101	Criminology and Law	3	1	-	4	Core, CC
2	FSM102	Forensic Photography and Image Analysis	3	1	-	4	Core, SEC
3	FSM103	Crime Scene Investigation	3	1	-	4	Core, CC
4	FSM104	Fundamentals of Dermatoglyphics Examination	3	1	-	4	Core, AEC
5	RMS002	Biostatistics and Research Methodology	4	0	-	4	Core, CC
6		Value added course (VAC)					
Practical/Viva-Voce/Jury							
7	FSM151	Lab- Crime Scene Investigation	-	-	4	2	Core, CC
8	FSM152	Lab- Fundamentals of Dermatoglyphics Examination	-	-	4	2	Core, CC
	RBL001	RBL 1	0	0	4	0	Core, RBL
		Total Credits				24	

M.Sc. (Forensic Sciences)
Batch: 2023-25
Semester: II

S. No.	Subject Code	Subjects	Teaching Load			Credits	Core/Elective/Pre-Requisite/Co Requisite
			L	T	P		
THEORY SUBJECTS							
1	FSM111	Forensic Ballistics and Explosives	3	1	-	4	Core, CC
2	FSM112	Forensic Medicine	3	1	-	4	Core, CC
3	FSM114	Fundamentals of Questioned Document Examination	3	1	-	4	Core, AEC
4	FSM115	Forensic Instrumental Analysis	3	1	-	4	Core, CC
5		OPE	2	-	-	2	Open Elective, OPE
Practical/Viva-Voce/Jury							
6	FSM161	Lab- Forensic Ballistics and Explosives	-	-	4	2	Core, CC
7	FSM162	Lab- Fundamentals of Questioned Document Examination	-	-	4	2	Core, CC
8	RBL002	RBL 2	0	0	4	0	Core, RBL
Discipline Specific Elective: (Opt any one)							
1	FSM121	Forensic Psychology	2	-	-	2	Elective, DSE
2	FSM122	Quality Assurance and Accreditation in Forensic Sciences	2	-	-	2	Elective, DSE
3	FSM123	Digital and Cyber Forensics	2	-	-	2	Elective, DSE
		Total Credits				24	



M.Sc. (Forensic Sciences) Specialization: Forensic Chemical Sciences
Batch: 2023-25
Semester: III

S. No.	Subject Code	Subjects	Teaching Load			Credits	Core/Elective/Pre-Requisite/Co Requisite
			L	T	P		
THEORY SUBJECTS							
1	FSM231	Advances in Forensic Chemistry	3	1	-	4	Core, CC
2	FSM232	Advances in Forensic Toxicology	3	1	-	4	Core, CC
Practical/Viva-Voce/Jury							
3	FSM251	Lab- Advances in Forensic Chemistry	-	-	4	2	Core, CC
4	FSM252	Lab- Advances in Forensic Toxicology	-	-	4	2	Core, CC
5	RBL003	RBL 3				2	Core, RBL
Discipline Specific Elective: (Opt any one)							
1	FSM 221	Chemical Instrumental Analysis	2	-	-	2	Elective, DSE
	FSM 222	Bank Frauds and Forensic Accounting	2	-	-	2	Elective, DSE
	FSM 223	Road Accident Investigation and Insurance Claims	2	-	-	2	Elective, DSE
2	INC001	Industry connect/FSIC	-	-	-	2	Core, INC
3	CCU108	Community connect	0	0	4	2	Core, CCU
		Total Credits				20	

M.Sc. (Forensic Sciences) Specialization: Forensic Biological Sciences
Batch: 2023-25
Semester: III

S. No.	Subject Code	Subjects	Teaching Load			Credits	Core/Elective/Pre-Requisite/Co Requisite
			L	T	P		
THEORY SUBJECTS							
1	FSM234	Advances in Forensic Biology	3	1	-	4	Core, CC
2	FSM235	Advances in Forensic Anthropology and Odontology	3	1	-	4	Core, CC
Practical/Viva-Voce/Jury							
3	FSM253	Lab- Advances in Forensic Biology	-	-	4	2	Core, CC
4	FSM254	Lab- Advances in Forensic Anthropology and Odontology	-	-	4	2	Core, CC
4	RBL003	RBL 3				2	Core, RBL
Discipline Specific Elective: (Opt any one)							
1	FSM 221	Chemical Instrumental Analysis	2	-	-	2	Elective, DSE
	FSM 222	Bank Frauds and Forensic Accounting	2	-	-	2	Elective, DSE
	FSM 223	Road Accident Investigation and Insurance Claims	2	-	-	2	Elective, DSE
	FSM 224	Microbial Forensics	2	-	-	2	Elective
2	INC001	Industry connect/FSIC	-	-	-	2	Core
	CCU108	Community connect	0	0	4	2	Core
		Total Credits				20	



M.Sc. (Forensic Sciences) Specialization: Forensic Physical Sciences
Batch: 2023-25
Semester: III

S. No.	Subject Code	Subjects	Teaching Load			Credits	Core/Elective/Pre-Requisite/Co-requisite
			L	T	P		
THEORY SUBJECTS							
1	FSM 236	Advances in Forensic Physics	3	1	-	4	Core, CC
2	FSM 237	Advances in Digital Forensics	3	1		4	Core, CC
Practical/Viva-Voce/Jury							
3	FSM 255	Lab- Advances in Forensic Physics	-	-	4	2	Core, CC
4	FSM 256	Lab- Advances in Digital Forensics	-	-	4	2	Core, CC
5	RBL003	RBL 3				2	Core, RBL
Discipline Specific Elective: (Opt any one)							
1	FSM 221	Chemical Instrumental Analysis	2	-	-	2	Elective, DSE
	FSM 222	Bank Frauds and Forensic Accounting	2	-	-	2	Elective, DSE
	FSM 223	Road Accident Investigation and Insurance Claims	2	-	-	2	Elective, DSE
2	INC001	Industry connect/FSIC	-	-	-	2	Core, INC
3	CCU108	Community connect	0	0	4	2	Core, CCU
		Total Credits				20	

M.Sc. (Forensic Sciences) Specialization: Forensic Chemical Sciences
Batch: 2023-25
Semester: IV

S. No.	Subject Code	Subjects	Teaching Load			Credits	Core/Elective/Pre-Requisite/Co Requisite
			L	T	P		
THEORY SUBJECTS							
1	FSM241	Modern and Applied Forensic Chemistry	3	1	-	4	Core, CC
2	FSM242	Advances in Forensic Pharmacology	3	1	-	4	Core, CC
Practical/Viva-Voce/Jury							
1	FSM261	Advance Forensic Chemistry and Pharmacology- Lab	-	-	4	2	Core, CC
2	FSM247	Dissertation (Compulsory for all specializations)	-	-		16	Core, Project
3	RBL004	RBL 4	0	0	4	2	Core, RBL
4		OPE	2	-	-	2	Open Elective, OPE
		Total Credits				30	



M.Sc. (Forensic Sciences) Specialization: Forensic Biological Sciences
Batch: 2023-25
Semester: IV

S. No.	Subject Code	Subjects	Teaching Load			Credits	Core/Elective/Pre-Requisite/Co Requisite
			L	T	P		
THEORY SUBJECTS							
1	FSM243	Forensic Serology and Genetics	3	1	-	4	Core, CC
2	FSM244	Forensic DNA Profiling and Bioinformatics	3	1	-	4	Core, CC
Practical/Viva-Voce/Jury							
1	FSM262	Advance Forensic Serology and DNA Profiling Lab	-	-	4	2	Core, CC
2	FSM247	Dissertation (Compulsory for all specializations)	-	-		16	Core, Project
3	RBL004	RBL 4	0	0	4	2	Core, RBL
4		OPE	2	-	-	2	Open Elective, OPE
Total Credits						30	

M.Sc. (Forensic Sciences) Specialization: Forensic Physical Sciences
Batch: 2023-25
Semester: IV

S. No.	Subject Code	Subjects	Teaching Load			Credits	Core/Elective/Pre-Requisite/Co Requisite
			L	T	P		
THEORY SUBJECTS							
1	FSM245	Advances in Forensic Ballistics	3	1	-	4	Core, CC
2	FSM246	Mobile and Wireless Device Forensics	3	1	-	4	Core, CC
Practical/Viva-Voce/Jury							
1	FSM263	Advance Wireless devices and Ballistics - Lab	-	-	4	2	Core, CC
2	FSM247	Dissertation (Compulsory for all specializations)	-	-		16	Core, Project
3	RBL004	RBL 4	0	0	4	2	Core, RBL
4		OPE	2	-	-	2	Open Elective, OPE
Total Credits						30	



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Course Modules

Semester- I



School: SSAHS		Batch: 2023-25	
Programme:		Master of Science (Forensic Science)	
Branch: FSM		Semester: 1st Semester	
1	Course Code	FSM 101	
2	Course Title	Criminology and Law	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understanding the concept of crime, criminology, their theories, the factors that contribute to a person becoming anti-social and the laws related to forensic context.	
6	Course Outcomes	<p>CO1: Define the concept of crime, various theories of crime and the factors responsible for the crime.</p> <p>CO2: Understanding the concept of criminology, victimology, crime against women and factors responsible for it.</p> <p>CO3: Outline the concept of penology, punishments and its types, prison and prisoners, youth crime and the factors responsible for it.</p> <p>CO4: Analyze the role of IPC, Cr PC and IEA in criminal justice system</p> <p>CO5: Evaluate the laws of IPC, Cr PC and IEA related to forensic proceedings.</p> <p>CO6: Create understanding about process of police investigation in cognizable and non-cognizable offences.</p>	
7	Course Description	The course “criminology and law” aims at developing basic understanding about crime, criminology, their theories and factors responsible for it. This course encompasses victimology, penology, punishments, prison and prisoners. Moreover, this course is focused on the laws of IPC, CrPC and IEA relating to the forensic proceedings. The knowledge of crime, criminology and law empowers students’ knowledge and skills as a tool for mental and social wellbeing.	
8	Outline syllabus		CO Mapping
	Unit 1	Concept of crime	
	A	Definition of crime, Types, characteristics and causes of crime	CO1
	B	Theories of crime, Crime prevention and management	CO1
	C	F.I. R	CO1, CO6
	Unit 2	CRIMINOLOGY I	



A	Criminology- definition and scope, Nature of criminology, Criminology vs. criminal justice, Importance of criminology			CO2
B	Schools of criminology, Victimology- victim and victimization, Types of victimization, Roles of victim in crime, Victimological theories			CO2
C	Crime against women, Legal provisions for female			CO2
Unit 3	CRIMINOLOGY II			
A	Penology- definition, nature and scope, Punishment- significance, concept, aims and types, Theories of punishment, Sentencing- principles, policies and procedure, Capital punishment			CO3
B	Prison types and classification of prisoners, Evolution and development of prison system in India. Probation- concept and scope, Probation in India- probation of offender's act, Parole- Meaning and scope			CO3
C	Youth and crime- genesis of youth crime, Trends and characteristics of crime among youth, Typology of youth criminals, Juvenile delinquency			CO3
Unit 4	Introduction to Indian law			
A	Indian penal code- definition and scope, Essential elements of crime- Actus Reus and Mens Rea, Punishments and general exceptions			CO4, CO6
B	CrPC- Importance of criminal procedure, Hierarchy, powers and duties of criminal courts, Fundamental rights article 20,21,22.			CO4, CO6
C	Indian Evidence Act (IEA), Expert, Expert witness, Expert testimony			CO4
Unit 5	Laws related to forensic Proceedings			
A	Indian penal code- General idea of sections- 300,302,304B,307,319,320,375,377,378,420,441,463,489A,499,503,511.			CO5, CO6
B	Criminal Procedure Code: General idea of sections: 291-93, 154,155,161,164,172,173,174,176,230-31			CO5, CO6
C	Indian Evidence Act: General idea of sections: 32, 45,45A,46, 47,47A 57, 58,59,60,62,63,73, 135, 136, 137, and 159			CO5, CO6
Mode of examination	Theory			
Weightage Distribution	CA	MTE	ETE	
	25%	25%	50%	
Text book/s*	<ol style="list-style-type: none"> 1. M.K., Child, I.L and Barry, H., A Cross- cultural Study of Correlates of Crime, Journal of Abnormal and Social Psychology, 1963. 2. Bajpai, G.S., Development without Disorders, Vishwavidyalaya Prakashan, Sagar (M. P.), 2002. 			



		<ol style="list-style-type: none">3. Ellis, L. and Walsh, Criminology – A Global Perspective, Allyn, and Bacon, Boston, 2000.4. M. Meguire, R. Morgan & R. Reiner; Oxford Handbook of Criminology, 2nd ed. Biddles Ltd, Lyon, 1997.5. Ram Ahuja, Criminology; Rewal Pub. Jaipur, 2000.
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POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	2	3	1	2	2	3	2
CO 2	3	2	2	2	1	2	1	2	1
CO 3	3	2	3	3	1	2	1	3	1
CO 4	3	3	3	3	-	3	1	2	2
CO 5	2	3	2	2	1	3	2	3	2
CO6	3	3	3	3	-	3	1	2	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 1st Semester	
1	Course Code	FSM-102	
2	Course Title	Forensic Photography and Image Analysis	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understanding the concept of photography, techniques used for forensic photography, their procedures, the factors that alter Image and different methods for analyzing doctored images.	
6	Course Outcomes	CO1 :: Define the fundamentals components of Camera. CO2 :: Understand the various elements of photographic equipment and camera CO3 :: Estimate the variations in different types of photography CO4 :: Develop the image by image processing methods CO5 :: Apply the photographic methods for forensic purpose CO5: Create knowledge of doing photography in UV and IR light at different ranges.	
7	Course Description	The course “Forensic Photography and Image Analysis” aims at developing basic understanding about photography, their techniques and procedures. This course encompasses structure and functions of camera, different methods of photography and types of photography and image. Moreover, this course is focused on Image and their analysis.	
8	Outline syllabus		CO Mapping
	Unit 1	Fundamentals of Camera	
	A	Camera and Types of lenses, 35 mm film / Digital SLR camera, ISO number.	CO1
	B	Exposure, Index, angle, scale, depth of field, light, ambient light	CO1
	C	Color temperature, flash/ strobe, shutter-speed, aperture, lenses	CO1
9	Unit 2	Elements of Forensic Photography	
	A	Introduction, Basic principles, Techniques of photography	CO2
	B	Photo imaging evidence Software for digital photography	CO2
	C	File formats-jpg, gif, bmp, tiff, raw	CO2
	Unit 3	Types of Photography	



A	Digital photography, Color photography and their Forensic significance	CO3
B	U.V photography, I.R photography, High speed photography, Aerial photography and their forensic significance	CO3, CO6
C	Close up, mid-range photography and their forensic significance.	CO3, CO6
Unit 4	Fundamentals of video technology	
A	Introduction to electronic photography, Synchronizing the analog signal, Digital signal processing	CO4
B	Color video, basics of digital television standard, basics of HD Video	CO4
C	Image acquisition and recording formats, optical media, time code, different types of video camera	CO4
Unit 5	Image Processing and Authenticity as Evidence	
A	Radiographic photography, Photogrammetry, Defects of sensors in digital image, Different scanning and printing technologies	CO5
B	Identification and segregation of computer synthesized or recaptured images from real images. Scrutinization and Identification of digitally manipulated photographs	CO5
C	Counter attacking image forensics.	CO5
Mode of examination	Theory	
Weightage Distribution	CA MTE ETE	
	25% 25% 50%	
Text book/s*	THE PRACTICAL METHODOLOGY OF FORENSIC PHOTOGRAPHY by DAVID R. REDSICKER, CRC PRESS FORENSIC SCIENCE IN CRIME INVESTIGATION by BS NABAR, Asia Law House	

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	1	2	2	2	3	1	1	-	-
CO 2	2	3	1	2	2	1	-	-	-
CO 3	3	2	2	3	2	2	-	2	2
CO 4	2	2	2	-	1	2	1	2	3
CO 5	3	3	2	3	3	2	2	3	3
CO6	2	3	2	2	1	2	1	2	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 1st Semester	
1	Course Code	FSM-103	
2	Course Title	Crime Scene Investigation	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understanding the concept of crime scene investigations, techniques used for recording the crime scene, the procedure for searching evidences, collection and preservation techniques. Advanced techniques which are used to investigate crime scene.	
6	Course Outcomes	CO1 :: Identify the role and importance of FSLs CO2 :: Evaluate different procedures for documentation techniques CO3 :: Cite the importance of crime scene reconstruction in criminal investigations and trials CO4 :: State the role of evidences in crime scene investigation CO5 :: Evaluate the application of biometric system for personal identification. CO6: Describe advancements in management of crime scene	
7	Course Description	The course “Crime scene Investigation” aims at developing basic understanding about crime scene investigation, their techniques and procedures for documenting. This course encompasses structure and functions forensic science laboratory, different branches in FSLs. Moreover, this course is focused on latest techniques for crime scene investigations.	
8	Outline syllabus		CO Mapping
	Unit 1	Basic Concepts of Forensic Science and FSL	
	A	Definition, Historical development of Forensic Science, Basic Principles of Forensic Sciences	CO1
	B	Forensic Science laboratories in India, Branches/Sections in FSLs, Organizational setup of FSLs	CO1
	C	Functions and services of FSLs Role of Forensic Scientist. The laboratory Management system	CO1
	Unit 2	Criminalistics-I	
	A	Introduction to crime scene Types of crime scene Securing the scene of crime	CO2
	B	Documenting the crime scene Note-making, Sketching, Photography, Videography	CO2



	C	Role and responsibilities of first arriving officer at crime scene	CO2
	Unit 3	Criminalistics-II	
	A	Techniques of searching at crime scene Processing of Physical evidence Collection of Physical evidences Safety considerations for evidence collection	CO3
	B	Preservation, Packaging, Sealing, Labeling of Physical evidence Forwarding of physical evidences to FSL Maintaining chain of custody	CO3
	C	Crime scene reconstruction and its steps Writing a reconstruction report of cases like Investigation of Road Accident crime scene.	CO3
	Unit 4	Evidence in Crime scene	
	A	Defining physical evidences Types of physical evidences Classification Role of physical evidences in criminal investigation and trials	CO4
	B	Admissibility of evidence in Court of Law Admissibility of Expert Testimony in Court Frye and Daubert standards	CO4
	C	Forensic Expert and Forensic Report Formats of Forensic Report writing Court Testimony Preparations for Pre-Court Presentations & Court appearance Examination in chief, Cross Examination and Re-examination Ethics in Forensic Science	CO4, CO6
	Unit 5	Advancements in Criminal Investigations	
	A	Forensic databases Information, manpower, logistics management of crime scene	CO5
	B	Digital imaging of crime scene 3-D scanning technique Tele forensic technology for crime scene investigation Mobile forensic units and mobile kits	CO5
	C	Global Positioning System Basic principles and applications Techniques and Technologies (Finger Print Technology, Face Recognition, IRIS, Retina Geometry, Hand Geometry for personal identification.	CO5
	Mode of examination	Theory	



Weightage Distribution	CA	MTE	ETE		
	25%	25%	50%		
Text book/s*	James, S.H and Nordby, J.J. (2003) Forensic Science: An introduction to scientific and investigative techniques CRC Press, Saferstein: Criminalistics (1976) Prentice Hall Inc., USA.				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	3	2	3	3	3
CO 2	2	3	2	2	2	3	3	3	3
CO 3	3	2	3	2	3	2	3	3	2
CO 4	3	3	3	2	3	3	2	2	3
CO 5	3	3	2	3	2	3	3	3	3
CO6	3	3	3	3	-	3	1	2	3



School: SSAHS	Batch: 2023-25	
Programme	Master of Science (Forensic Science)	
Branch: FSM	Semester: 1st Semester	
1	Course Code	FSM-104
2	Course Title	Fundamentals of Dermatoglyphics Examination
3	Credits	4
4	Contact Hours (L-T-P)	3-1-0
	Course Type	Compulsory
5	Course Objective	To provide students understanding the concept of fingerprints, different types and techniques used for recording the fingerprint, the procedure for searching fingerprints, collection and preservation techniques and methods for comparison. It make students approachable for their advanced for learning latest methods for fingerprint development.
6	Course Outcomes	CO1 :Define fundamentals and history of forensics dermatoglyphics CO2 : Understand the various methods of collection of fingerprints found at crime scene CO3 : Apply various methods for detection of fingerprints CO4 : Analyze various techniques for comparison of fingerprint pattern CO5:Evaluate the use of biometric in fingerprint science. CO6: Know the Advancements in development of latent fingerprints and evaluation with the use of modern technology.
7	Course Description	The course “Fundamentals of Dermatoglyphics Examination” aims at developing understanding about fingerprint examination, their techniques and procedures for documenting and developing. This course encompasses the procedure for comparison. Moreover, this course is focused on edgeoscopy and poroscopy.
8	Outline syllabus	CO Mapping
	Unit 1	Introduction to Fingerprints
	A	Definition, Historical development of fingerprint science, Ridges and its formation, Formation of fingerprints
	B	Fundamental principles of fingerprint science, Fingerprint pattern and its types, Fingerprint ridge characteristics
	C	Composition of fingerprint residue Poroscopy and its significance Edeoscopy and its significance
	Unit 2	Collection and Classifying Fingerprints
	A	Types of fingerprints on surface Methods for collection of fingerprints- deceased and live persons



B	Single digit fingerprint classification Ten- digit and advanced fingerprint classification			CO2
C	Ridge Counting and Ridge Tracing Cataloguing of Fingerprint Record			CO2
Unit 3	Methods for development of Fingerprints			
A	Detection of Latent Fingerprints by Physical techniques Detection of Latent Fingerprints by Chemical techniques			CO3, CO6
B	Mechanism of Detection of Fingerprints by different Developing reagents			CO3, CO6
C	Different light source applications in fingerprint detection Preservation of developed fingerprints			CO3, CO6
Unit 4	Comparison Protocols			
A	Class and individual characteristics (Galton's details) different ridge characteristics			CO4
B	Standards of proof, Role and Function of Automatic Fingerprint Identification System (AFIS)			CO4
C	Comparison criteria for Poroscopy and Edgeoscopy.			CO4
Unit 5	Advancements in Fingerprint Science			
A	AFIS vs IAFIS, Biometric Identification, Micro X-ray Fluorescence			CO5, CO6
B	Color changing films utilized in developing Fingerprints Developments of prints from metal objects Development of prints from washed surface			CO5, CO6
C	Non-invasive techniques of Fingerprint development			CO5, CO6
Mode of examination	Theory			
Weightage Distribution	CA	MTE	ETE	
	25%	25%	50%	
Text book/s*	James, S.H and Nordby, J.J. (2003) Forensic Science: An introduction to scientific and investigative techniques CRC Press, Saferstein : Criminalistics (1976) Prentice Hall Inc., USA.			

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	1	1	2	1	2	1	2	2
CO 2	3	3	2	3	2	3	2	3	3
CO 3	3	3	3	3	1	2	2	3	2
CO 4	3	3	3	3	1	2	2	3	2
CO 5	3	3	3	3	2	1	2	3	3
CO6	3	3	3	3	2	2	2	3	3



School: SSAHS	Batch: 2023-25	
Programme	Master of Science (Forensic Science)	
Branch: FSM MFS	Semester: I	
Subject	Biostatistics and Research Methodology	
Credit	4	
Lecture	4-0-0	
Code	FSM 106	
Course Objective	<ol style="list-style-type: none"> 1. To develop analytical skills in the students 2. To impart examples of research in decision making 3. To train the students in evaluating research articles 	
Course Outcomes	CO1: Define the basic concepts and methods of research. CO2: Explain the descriptive statistics. CO3: Apply the application of descriptive statistics on data. CO4: Classify the inferential statistics and its application. CO5: Evaluate the parametric test and its application on data. CO6: Discuss the non-parametric test and its application on data	
Course Description	To help the students to understand the basic principles of biostatistics & research methodology and applied to draw the inferences from the data.	
Outline syllabus		CO Mapping
Unit 1	Descriptive statistics	CO1, CO2
	Type of variables, Data entry and presentation	CO1,CO2
	Summarization of data, Frequency distribution	CO1,CO2
	Measures of central tendency, Variability measures	
Unit 2	Probability theory	CO2,CO3
A	Definition of Probability; Mutually exclusive and independent events. Joint, marginal and conditional probabilities,	CO2,CO3
B	Probability distributions: Binomial, Poisson and Normal	CO1, CO3
C	Bayes theorem	CO2,CO3
Unit 3	Measures of association	
A	Cross-tabulation; Chi-square test, Odds ratio, Relative risk, Regression analysis	CO3,CO4
B	Correlation coefficient. Interpretation of the Pearson correlation coefficient	CO1, CO3
C	Lab session with software.	CO3,CO4
Unit 4	Sampling and sample size determination	CO2,CO3
A	Concepts of population and sample Parameter and estimator, Sampling distribution and Methods of Sampling	CO4,CO5
B	Sample size calculation	CO4,CO5 CO2,CO3
C	Lab session with software	CO4,CO5
Unit 5	Estimation	CO2,CO3



A	CLT, Point and interval, Confidence intervals and their use.		CO5,C06
B	Hypothesis testing: Null and Alternative hypothesis Type I and Type II errors. Level of Significance, Critical Region, Power of a test, Decision making using critical value approach and p-value approach		CO5,C06
C	Lab session with software.		CO5,C06
Mode of examination		Theory/Jury/Practical/Viva	
Weightage Distribution	CA	MTE	ETE
	25%	25%	50%
Text book/s*	S.N. Dwivedi et al. Medical Statistics		
Other References	<ul style="list-style-type: none"> • Indrayan A, Sarmukaddam SB. Medical Biostatistics. New York, USA: Marcel Dekker, Inc; 2001. • Peter Armitage, Theodore Colton. Encyclopedia of Biostatistics. Wiley. 2005 • Methods in Biostatistics, Jaypee Brothers, Medical Publishers,2006 . 		

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	2	2	3	3	2	2	2	2	2
CO 2	2	2	2	3	3	3	2	2	2
CO 3	2	2	3	3	2	2	2	2	2
CO 4	3	3	2	3	3	3	2	2	3
CO 5	3	2	2	3	2	2	3	2	3
CO6	2	2	2	1	2	2	1	1	1



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester:1	
1	Course Code	FSM 151	
2	Course Title	Crime Scene Investigation- Lab	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course objective	This course will give hand-on experience to the students in handling physical evidences, packing and forwarding the evidences and their examination. This course will also give practical exposure to the students in different aspects of crime scene investigation.	
6	Course outcome	CO1: Identifying the steps in crime scene investigation. CO2: Understanding the documentation of crime scene using sketching methods. CO3: Application of photographic techniques in recording the crime scene. CO4: Analysing different steps in crime scene investigation. CO5: Assessing the reconstruction of crime scene by using different techniques CO6: Create and apply recent advancement in evidence collection and crime scene reconstruction.	
7	Course description	This course includes the practical exposure to overall steps taken during crime scene investigation and with the help of those steps, how reconstruction of crime scene is done, will be demonstrated.	
8	Outline syllabus		CO Mapping
	Unit 1	Demonstration of Crime Scene Management	CO1
		<ul style="list-style-type: none"> • Protocols to assess the Crime Scene • Documentation of Crime Scene • Recording of Crime Scene 	
	Unit 2	Methods for Searching of Physical Evidences at Scene of Crime	CO2
		<ul style="list-style-type: none"> • Rough Sketch of Crime Scene • Final Sketch of Crime Scene • Sketching of Indoor Scene of Crime (Murder or Suicide) • Sketching of Outdoor Scene of Crime (Accident) 	
	Unit 3	Fundamental of Photography Techniques In Recording the Crime Scene	CO3
		<ul style="list-style-type: none"> • Photography of Indoor Crime Scene • Photography of Outdoor Crime Scene 	
	Unit-4	Crime Scene Search Methods	CO4



		<ul style="list-style-type: none"> • Methods for Searching of Physical Evidences at Scene of Crime (Homicide or Suicide). 	
		<ul style="list-style-type: none"> • Methods for Searching of Physical Evidences at Scene of Crime (Theft or Dacoity or Robbery). 	
	Unit 5	Evidence collection and crime scene reconstruction.	CO5 & CO6
		<ul style="list-style-type: none"> • Collection & Packing of Evidences 	
		<ul style="list-style-type: none"> • Preservation of Evidences 	
		<ul style="list-style-type: none"> • Labelling and Forwarding of Evidence From Crime Scene 	
		<ul style="list-style-type: none"> • Reconstruction of Murder Case 	
		<ul style="list-style-type: none"> • Reconstruction of Vehicular Case 	
		<ul style="list-style-type: none"> • Report writing and presentation in the court of law 	
	Mode of examination Weightage Distribution	Practical/Viva	ETE
		CA	CE ETE
		25%	25% 50%

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	3	3	3	2	3	3	3	3
CO2	3	3	2	2	3	3	3	3	3
CO3	2	3	3	3	3	3	3	2	3
CO4	3	3	3	3	3	3	2	2	2
CO5	3	2	3	3	2	3	3	3	3
CO6	3	3	3	2	1	1	1	3	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester:1	
1	Course Code	FSM 152	
2	Course Title	Fundamentals of Dermatoglyphics Examination-Lab	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course objective	To enable students about the fingerprint patterns, their types, different classification procedure and comparison method. It also prompt to get overview of writing reports and their presentations in court of law.	
6	Course outcome	<p>CO1: Understand the various fingerprint pattern evidences found at crime scene</p> <p>CO2 : Observe the different characteristics of fingerprints</p> <p>CO3: Identify the pattern using ridge counting and tracing</p> <p>CO3: Examine the finger impressions using physical and chemical methods</p> <p>CO4: Analyze impressions found at different surfaces</p> <p>CO5: Evaluate the comparison and report</p> <p>CO6: Know the modern methods for latent print development and their comparison.</p>	
7	Course description	The course creates the understanding about fingerprint collection and development procedures, classifying on different types of classification and writing reports.	
8	Outline syllabus		CO Mapping
	Unit 1	To demonstrate the various methods of obtaining fingerprint and its types.	CO1
		<ul style="list-style-type: none"> To Record a Finger Print Chart by Direct Print Method and Rolling Method 	
		<ul style="list-style-type: none"> To Record a Finger Print Chart by Rolling Method. 	
		<ul style="list-style-type: none"> Identification of different types of fingerprints. 	
		<ul style="list-style-type: none"> To perform Henry's System of Classification 	
	Unit 2	Observe the different characteristics of fingerprints	CO2
		<ul style="list-style-type: none"> To identify the class characteristics of fingerprints 	
		<ul style="list-style-type: none"> To identify the individual characteristics of fingerprints 	
		<ul style="list-style-type: none"> To perform ridge tracing 	
		<ul style="list-style-type: none"> To perform ridge counting. 	
	Unit 3	Development of Latent Fingerprints using Physical and Chemical methods	CO3



		<ul style="list-style-type: none"> To identify latent fingerprint using chemical methods(Iodine Fuming, Silver Nitrate& Ninhydrine). 	
		<ul style="list-style-type: none"> To identify latent fingerprint using Physical methods(Powder method). 	
Unit 4	Protocols to analyse latent fingerprints found on different surfaces		CO4
		<ul style="list-style-type: none"> Identification and lifting of latent fingerprint found on porous surface (Paper, Wood and Cardboard) 	
		<ul style="list-style-type: none"> Identification and lifting of latent fingerprint found on Semi-porous surface (Painted wood) 	
		<ul style="list-style-type: none"> Identification and lifting of latent fingerprint found on Non-porous surface (Plastic, Metal) 	
Unit 5	Comparison of fingerprints and Report writing		CO5, CO6
		<ul style="list-style-type: none"> Comparative study of latent fingerprint developed using different chemical methods. 	
		<ul style="list-style-type: none"> Comparative study of latent fingerprint developed using different Physical method. 	
		<ul style="list-style-type: none"> Report writing and presentation in the court of law. 	
Mode of examination	Practical/Viva		
Weightage Distribution	CA	CE	ETE
	25%	25%	75%

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	3	3	3	3	3	3	3	3
CO2	3	3	2	2	3	3	3	3	3
CO3	2	3	3	3	3	3	3	2	2
CO4	3	3	3	2	3	3	2	3	3
CO5	3	2	3	3	2	3	3	3	3
CO6	3	3	3	2	1	2	1	2	3



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Semester-II



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 2	
1	Course Code	FSM-111	
2	Course Title	Forensic Ballistics and Explosives	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To make students aware of ballistics, types and their components. Different methods for firearm collection and their examination procedures. Estimate the GSR and their composition and defining range of firing. The types of explosives and methods of analysis.	
6	Course Outcomes	CO1 :: Define forensic ballistics and its components CO2 :: Understand concept of different types of ballistics CO3 :: Apply methods of firearm evidence examination CO4 :: Analyze the types and characteristics of explosives CO5 :: Evaluate the methods for forensic examination of different explosives CO6: Mechanism of muzzle loader and breech loaders and mechanism of External and terminal ballistics.	
7	Course Description	The course creates knowledge of ballistics, types of ballistics, classification of ballistics, firearm as evidence and their methods for examination. The course also focussed on different analytical procedures for GSR and explosives.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Ballistics	
	A	Definition, history of firearms, branches of ballistics, breech loader and muzzle loader (Match lock, Wheel lock, Snaphaunce, Flint lock, Percussion), Smooth bore (Shotgun) and their parts, Rifled firearms, (Revolver, Pistol and Rifles), Indian Arms Act, Country Made/Improvised Firearms. Firing mechanism of different firearms.	CO1, CO6
	B	Classification of firearms on different parameters, ammunition and its types.	CO1, CO6
	C	Classification and constructional features of different types of cartridges, types of primers and priming composition, propellants and their compositions, velocity and pressure characteristics under different conditions, various types of bullet and compositional aspects, latest trends in their manufacturing and design projectile, headstamp markings.	CO1, CO6



Unit 2	Ballistics and its types	
A	Definition of Internal Ballistics Propellant and its manner of burning Muzzle velocity Factors affecting muzzle velocity	CO2, CO6
B	Definition of External Ballistics Trajectory of Bullet Different factors affecting flight of bullet	CO2, CO6
C	Definition of Terminal Ballistics Mechanism of firearm injuries Bullet Entry/Exit Hole Identification Evaluation of Accidental injuries	CO2,CO6
Unit 3	Firearm as Evidence and its Examination	
A	Types of Physical evidences available in crime scene involving firearm Handling procedures of firearm evidences Principles and Practice of identification of Firearm	CO3
B	Class and Individual characteristics Examination of various marks on fired cartridge and bullets Test firing and its technique Comparison and matching of marks on evidence and test firing exhibits Integrated Ballistics Identification System and National Integrated Ballistic Information Network	CO3
C	Burning, scorching, blackening, tattooing and metal fouling shots dispersion and GSR distribution, time offering different method employed, and their limitations, Bullet recovery, time of firing. Gunshot Residues Mechanism and its formation Methods for lifting GSR Chemical test for analysis of GSR	CO3
Unit 4	Explosive-I	
A	Definition of Explosives, Definition as per Indian Explosive Acts. History of Explosives, Chemistry of explosives, Deflagration and Detonation phenomenon (Redox Chemistry, Kinetics-Molecular Theory of gases & Gas Laws).	CO4
B	Characteristics of high and low explosives, Dust explosion, Gas/25apour explosion, BLEVE, Effect of blast wave on structures & human and Pyrotechnics.	CO4
C	Improvised Explosive Device: Definition of IED, Components of IED, Explosives Initiation (Explosive Trains); Types (Molotov cocktail, Letter bomb, Pipe bomb, VBIED and CBRN), Detection of Hidden Explosives.	CO4



Unit 5	Explosives-II			
A	Bomb Scene: Specific approach to scene of explosion, Reconstruction of sequence of events, Evaluation and assessment of scene of explosion			CO5
B	Analysis of Explosive: Pre-blast and Post blast residue collection Different methods for collection of debris.			CO5
C	Systematic examination of explosives and explosion residues in the laboratory using chemical and instrumental techniques and interpretation of results.			CO5
Mode of examination	Theory			
Weightage Distribution	CA	MTE	ETE	
	25%	25%	50%	
Text book/s*	Jauhri, M. 1980 : Monograph on Forensic Ballistics, Govt. Of India Publication, New Delhi. Burrad, 1951 : The Identification of Firearms and Forensic Ballistics..			

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	2	2	2	3	3
CO 2	3	2	3	2	2	2	-	2	3
CO 3	3	2	3	3	2	2	2	3	3
CO 4	3	3	3	3	3	3	1	3	2
CO 5	3	2	2	3	2	3	-	2	3
CO 6	3	3	3	3	1	2	-	2	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 2	
1	Course Code	FSM-112	
2	Course Title	Forensic Medicine	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To make students acquainted with the knowledge of death, its types, post mortem changes, various types of post mortem changes, different methods of autopsy, legal procedures involved. The course also encompasses the injuries and clinical aspects of forensic medicine.	
6	Course Outcomes	CO1:: Define the different types of deaths CO2:: Classify the various type of post mortem changes CO3:: Apply the legal procedures for autopsy CO4:: Assess the internal and external injuries CO5:: Evaluate the aspects of clinical forensic medicine CO6:: Analyze to know manner of death, modes of death and wound formation.	
7	Course Description	The course provides the procedures of autopsy and legal proceedings involved in it. It also focuses on injuries and different aspects of clinical forensic medicine.	
8	Outline syllabus		CO Mapping
	Unit 1	Death and its types	
	A	Definition, Scope of Forensic Medicine	CO1
	B	Types of death-somatic/clinical/cellular Molecular and brain death including cortical death, brain-stem death, Natural and unnatural death	CO1,CO6
	C	Manner of death, Modes of death – coma, syncope, asphyxia and sudden death	CO1,CO6
	Unit 2	Post-mortem Changes	
	A	Early changes after death, Cooling of dead body, Postmortem lividity/Hypostasis, Rigor mortis, Cadaveric spasm	CO2
	B	Heat and cold stiffening, Putrefaction, Mummification, Formation of Adipocere, Maceration	CO2
	C	Preservation of dead bodies, Examination of mutilated bodies or fragments, Exhumation	CO2
	Unit 3	Autopsy	
	A	Definition, Objectives of Post mortem examination, Legal procedures involved	CO3



B	Types of Autopsies, Internal examination, External examination	CO3
C	Viscera, Collection and Preservation, Post mortem Report	CO3
Unit 4	Injuries	
A	Definition, Simple & Grievous hurt Abrasion and its types, Bruises and its types Laceration and its types	CO4,CO6
B	Stab wounds, Incised wounds Chop wounds, Defense wounds Self-inflicted/Fabricated wounds	CO4,CO6
C	Antemortem and Postmortem Injuries Thermal injuries Medico-legal aspects of injuries	CO4,CO6
Unit 5	Clinical Forensic Medicine	
A	Definition and types of sexual offences, adultery, unnatural sexual offences, sodomy, incest, lesbianism, buccal coitus, bestiality, indecent assault, fetichism, transvestism, voyeurism, sadism, necrophagia, masochism, exhibitionism, frotteurism, 28ecrophilia,	CO5
B	Age determination of the victim – abortion, infanticide	CO5
C	Collection of samples from sexual assault victims	CO5
Mode of examination	Theory	
Weightage Distribution	CA MTE ETE	
	25% 25% 50%	
Text book/s*	The essentials of forensic medicine and toxicology by ks narayan reddy, Jaypee brothers medical publishers pvt. Ltd. textbook of forensic medicine and toxicology by anil aggrawal, apc books	

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	2	2	2	3	3
CO 2	3	2	3	2	2	2	3	2	3
CO 3	3	2	3	3	2	2	2	3	2
CO 4	3	3	3	3	3	3	2	3	3
CO 5	3	2	2	3	2	3	3	3	3
CO6	3	3	2	1	-	1	1	3	3



Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 2nd	
1	Course Code	FSM 114	
2	Course Title	Fundamentals of Questioned Document Examination	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understanding of different types of questioned documents, the types of forgery generally encountered, to learn the methods of their detection and examination and handwriting identification and to identify and examine typewritten documents.	
6	Course Outcomes	CO1: Define the basics of documents, their identification, examination, collection and preservation. CO2: Understanding and application of handwriting characteristics in the process of comparison. CO3: To describe and analyse various types of forgery and forged documents. CO4: Identification and analysis of different types of documents. CO5: To evaluate the different types of documents using instrumental methods. CO6:: Use of advance technology for the detection of forgery.	
7	Course Description	This course aims at developing basic understanding about questioned documents, its identification and examination. This course is also focused on the handwriting characteristics and comparison process. This course encompasses various instrumental techniques for the detection of various types of documents.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to questioned document	
	A	Definition, importance, Classification of documents	CO1
	B	Handling and preservation of documents	CO1
	C	Examination of documents	CO1
	Unit 2	Handwriting	
	A	Basic rule of handwriting, Various writing features and estimation	CO2
	B	Characteristics of handwriting- individual and class Natural variation	CO2
	C	Anonymous and disguised writings, Process of comparison	CO2
	Unit 3	Forgery and its detection	
	A	Definition and types of forgery, Characteristics of forgery	CO3



	B	Examination of forged documents				CO3
	C	Secret, indented and charred documents				CO3
	Unit 4	Examination of different types of documents				
	A	Identification of typewriting- typist and typewriter device, Examination of printed matter				CO4
	B	Examination of seal impression and other mechanical impressions				CO4
	C	Determination of age of document- paper, ink and writings. Examination of counterfeit currency notes				CO4
	Unit 5	Instrumental analysis of documents				
	A	Alternate light sources stereomicroscopy				CO5,CO6
	B	UV and IR spectroscopy- basic principle and techniques				CO5,CO6
		Video spectral comparator (VSC)				
	C	Electrostatic detection apparatus (ESDA)				CO5,CO6
	Mode of examination	Theory				
	Weightage Distribution	CA	MTE	ETE		
		25%	25%	50%		
	Text book/s*	<ol style="list-style-type: none"> 1. Ordway Hilton; "Scientific Examination of Questioned Documents", Revised Edition, Elsevier, NY, 1982. 2. Albert S. Osborn; "Questioned Documents", 2nd Ed., Universal Law Pub., Delhi, 1998. 3. Albert S Osborn; "The Problem of Proof", 2nd Ed., Universal Law Pub. Delhi, 1998. 				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	2	3	3	2	2	3	3	3
CO2	3	3	3	2	3	3	3	3	3
CO3	3	3	3	3	2	2	2	3	3
CO4	3	3	3	1	3	3	2	2	3
CO5	3	2	2	2	2	3	3	3	3
CO6	3	3	3	2	1	1	1	3	3

School: SSAHS	Batch: 2023-25
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Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 1st Semester	
1	Course Code	FSM 115	
2	Course Title	Forensic Instrumental Analysis	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To impart knowledge of the various instruments used in the analysis of different substances encountered during a criminal investigation, their methods of sample analysis and forensic applications.	
6	Course Outcomes	<p>CO1: Conceptual understanding of laws, principle and instrumentation of various types of spectroscopies and its forensic applications.</p> <p>CO2: Explain the laws, principle and instrumentation of distillation and chromatographic techniques and its forensic applications.</p> <p>CO3: To apply the principle and instrumentation of different types of column chromatography and their forensic significance.</p> <p>CO4: To analyze the knowledge of centrifugation and electrophoretic techniques for separation and identification of biomolecules/complex mixtures.</p> <p>CO5: To evaluate the principles of microscopy and different immunochemical interactions in forensic context.</p> <p>CO6: Forensic applications of Compound, Comparison, Fluorescence, Polarized, Stereo microscope and immunological techniques.</p>	
7	Course Description	The course “forensic instrumental analysis” aims at developing a thorough knowledge and understanding of various types of instrumentation, their forensic applications, their method of sample analysis and the different types of detectors used for detecting the various substances.	
8	Outline syllabus		CO Mapping
	Unit 1	INSTRUMENTAL METHODS- PHYSICAL	
	A	<p>Spectroscopy- Introduction, electromagnetic spectrum, various sources of radiation</p> <p>UV-visible, infrared, atomic absorption/emission spectroscopy</p>	CO1
	B	Forensic application of spectroscopy	CO1
	C	Atomic and molecular spectra – energy level, quantum number, energy states, molecular orbitals	CO1



Unit 2	INSTRUMENTAL METHODS- CHEMICAL (I)			
A	Distillation- principle and working			CO2
B	Chromatography- theory and principles Thin layer chromatography (TLC) Paper chromatography			CO2
C	Forensic applications of chromatographic techniques			CO2
Unit 3	INSTRUMENTAL METHOD- CHEMICAL (II)			
A	Gas chromatography (GC)- working principle, ray diagram, instrumentation			CO3
B	HPLC- working principle, ray diagram, instrumentation			CO3
C	HPLTC- working principle, ray diagram, instrumentation Forensic applications of detectors			CO3
Unit 4	INSTRUMENTAL METHOD- BIOLOGY (I)			
A	Electrophoresis- theory and principle, instrumentation Low voltage, high voltage, gel electrophoresis, capillary electrophoresis.			CO4
B	Forensic application of electrophoretic techniques			CO4
C	Centrifugation techniques- basic principle Types of centrifugation Forensic application of centrifugation			CO4
Unit 5	INSTRUMENTAL METHOD- BIOLOGY (II)			
A	Immunochemical techniques- general principle Types- RIA, MIA, ELISA Forensic application of Immunochemical techniques			CO5,CO6
B	Microscopy- theory and basic principle			CO5
C	Forensic applications of Compound, Comparison, Fluorescence, Polarized, Stereo microscope.			CO5,CO6
Mode of examination	Theory			
Weightage Distribution	CA	MTE	ETE	



	25%	25%	50%	
Text book/s*	<ol style="list-style-type: none">1. Settle, F.A.: Handbook of Instrumental Techniques for Analytical Chemistry, Prentice Hall, 1997.2. R J Mayer and J H Walker., Immunochemical Methods in Cell and Molecular Biology Academic Press, London. 1987.3. Reiner Westermeier Electrophoresis in Practice: A Guide to Methods and Applications of DNA and Protein Separations, Fourth Edition. First published:25 October 2004.4. G.R Chatwal & S.K Anand; “Instrumental Methods of Chemical Analysis”, Himalaya Publ. House, 2004.			

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	2	3	3	2	3	3	2	2
CO2	3	3	2	2	3	3	3	2	2
CO3	3	3	3	3	3	3	3	3	2
CO4	3	3	3	3	3	3	2	2	2
CO5	3	2	3	3	2	3	3	2	3
CO6	2	2	1	2	2	1	1	3	2



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester:2	
1	Course Code	FSM 161	
2	Course Title	Forensic Ballistics and Explosives-lab	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course objective	To gain knowledge on opening of firearm evidences. To identify the characteristics of ammunition, assess different components of cartridges and bullets.	
6	Course outcome	CO1 :: Define measures for opening and marking of firearm exhibits CO2 :: Understand the characteristics of bullets and firearms CO3 :: Apply different characteristics to dismantle and assemble of small arms CO4 :: Analyze different components of firearm and cartridges CO5 :: Evaluate components of shot gun cartridge CO6:: Create the understanding about comparison of shotgun and rifle cartridge	
7	Course description	The course gives hand on experience of opening procedures of firearm exhibit. It discusses about assessment of bullets and cartridge cases. It also evaluates the components of shot gun cartridge.	
8	Outline syllabus		CO Mapping
	Unit 1	Analysis of explosive residues	CO1
		Extraction of explosive residue	
		Chemical test for inorganic constitutes of explosives	
		Chemical test for organic constitutes of explosives	
	Unit 2	Study and identify different types of bullet and firearms.	CO2
		Study of shot gun firearm	
		Study of shot refiled firearm	
		Examination of rifled bullet	
		Examination of shot gun bullet	
	Unit 3	To dismantle and assemble all types of small arms, and to record their data, lock mechanism and trigger pull	CO3
		dismantle and assemble of revolver	
		dismantle and assemble of mouser	
		Study of lock of mechanism in the revolver	
	Unit 4	Study different components of firearm and cartridges	CO4,CO6
		Study of shotgun cartridge components	
		Study of rifle cartridge components	
		Study different components of rifle firearm	
		Study different components of shotgun firearm	



Unit 5	Study of Shot Gun Ammunition			CO5, CO6
	Examination heavy components of GSR			
	Chemical test for GSR			
	Microscopic examination of GSR			
Mode of examination	Practical/Viva			
Weightage Distribution	CA	MTE	ETE	
	25%	25%	50%	

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	2	3	2	2	2	3	3	3
CO2	3	3	3	2	3	2	3	3	2
CO3	3	3	3	3	2	2	2	2	3
CO4	3	3	3	1	1	3	2	3	3
CO5	3	2	2	2	2	3	3	3	3
CO6	3	3	2	2	1	1	1	3	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 2semester	
1	Course Code	FSM 162	
2	Course Title	Fundamentals of Questioned Documents LAB	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course objective	The objective of this course is to give practical exposure to the students in different aspects of questioned documents, the types of forgery encountered. To learn the methods of their detection, examination and handwriting identification.	
6	Course outcome	CO1: Define the class and individual characteristics of handwriting. CO2: Understanding and examination of various types of forgery. CO3: Examining various types of seal impressions documents. CO4: Analysing various methods to decipher secret, indented and charred documents. CO5: Evaluate various methods for examining ink and paper. CO6: Build knowledge of examination of traced and simulated forgery.	
7	Course description	This course includes the experimentation for detecting and examining various types of questioned documents, forgery, alterations, ink and paper etc.	
8	Outline syllabus		CO Mapping
	Unit 1	Identification of handwriting characteristics	CO1
		<ul style="list-style-type: none"> • Identification of class characteristics of handwriting. 	
		<ul style="list-style-type: none"> • Identification of individual characteristics of handwriting. 	
		<ul style="list-style-type: none"> • Identify the characteristic features of handwriting and compare the two handwriting samples (control and suspect). 	
		<ul style="list-style-type: none"> • To prepare master pattern for the given sample of handwriting. 	
		<ul style="list-style-type: none"> • To mark and authenticate the Questioned, Specimen and Admitted document and prepare questionnaire for examination of questioned document. 	
	Unit 2	Examination of various types of forgery	CO2
	A	<ul style="list-style-type: none"> • Examination of traced and simulated forgery, alterations and erasures 	
		<ul style="list-style-type: none"> • Detection of alterations and erasures in a document using chemical or physical method. 	



		<ul style="list-style-type: none"> • Comparison of Forged and Genuine Document by VSC & Other Methods 	
Unit 3	Examining various types of seal impressions documents		CO3
	<ul style="list-style-type: none"> • Examination of rubber stamp and other mechanical impressions 		
	<ul style="list-style-type: none"> • To determine, whether two or more rubber stamp impressions resulted from the same stamp on the basis of different features of rubber stamps. 		
Unit 4	Analysing various methods to decipher secret, indented and charred documents.		CO4
	<ul style="list-style-type: none"> • Decipherment of indented document by chemical and physical methods 		
	<ul style="list-style-type: none"> • Decipherment of secret document by chemical and physical methods 		
	<ul style="list-style-type: none"> • Decipherment of charred document by chemical and physical methods 		
Unit 5	Examination of ink and paper		CO5, CO6
	<ul style="list-style-type: none"> • Microscopic analysis of pulp properties of paper to differentiate the paper. • To compare different inks for their origin using Spectrophotometer. • To perform TLC for the different ink samples. • To examine various security features of currency notes. 		
Mode of examination	Practical/Viva		
Weightage Distribution	CA	CE	ETE
	25%	25%	50%

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	2	3	2	2	2	3	3	3
CO2	3	3	3	2	3	2	3	3	3
CO3	3	3	3	3	2	2	2	2	3
CO4	3	3	3	1	1	3	2	2	2
CO5	3	2	2	2	2	3	3	3	3
CO6	3	3	2	2	1	2	1	3	3



Discipline Specific Elective: Any One

School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 2nd	
1	Course Code	FSM 121	
2	Course Title	Forensic Psychology & Psychiatry	
3	Credits	2	
4	Contact Hours (L-T-P)	2-0-0	
	Course Type	Compulsory	
5	Course Objective	The objective of this course is to introduce the concept of psychology, various tools for assessing psychology of criminal and investigative techniques.	
6	Course Outcomes	CO1: Define the Forensic Psychology, its role in crime, ethical issues and modus operandi. CO2: Understand the assessment tool for psychology, deception and its current researches. CO3: Demonstrate the Lie detection technique, criminal profiling and types. CO4: Analyse different techniques of psychology and its forensic significance. CO5: Evaluate and describe forensic psychiatry, various mental disorders and illness CO6: Advance instrumental techniques for the detection of deception	
7	Course Description	The course “forensic psychology and psychiatry” aims at developing basic understanding about psychology, its role in crime. This course encompasses various investigative techniques and its role in crime investigation. This course is also focused on various mental disorders and illness, laws related to mental health and various psychological assessment tools.	
8	Outline syllabus		CO Mapping
	Unit 1	Forensic psychology	
	A	Definition and scope Role of forensic psychology in investigation of crime	CO1
	B	Ethical issues in forensic psychology	CO1
	C	Crime and psychopathology, genetics and crime, serial murders, Modus Operandi	CO1
	Unit 2	Psychological assessment	
	A	Psychological assessment tools	CO2



	B	Methods for detection of deception Non-verbal detection, statement assessment, hypnosis, voice stress analyser	CO2
	C	Current research in detection of deception/truth finding mechanisms	CO2
	Unit 3	Investigative techniques- Forensic Psychology- I	
	A	Lie detection- Historical aspects, theory, working principle, Question formulation techniques, interviewing technique procedure	CO3, CO6
	B	Legal and ethical aspects Rights of an individual	CO3
	C	Criminal profiling- need and types	CO3,CO6
	Unit 4	Investigative techniques- Forensic Psychology- II	
	A	Narco- analysis- Historical aspects, theory, working principle	CO4,CO6
	B	Brain mapping- Historical aspects, theory, working principle	CO4,CO6
	C	Legal and ethical aspects, Rights of an individual	CO4
	Unit 5	Psychiatry	
	A	Definition, classification of common mental illness, post-traumatic stress disorder, antisocial control stress disorder.	CO5
	B	Mental Health Act True and feigned insanity, lucid interval, Mc. Naughten's rule <hr/> Classify and describe delusions, hallucinations, illusions, and obsession with exemplification.	CO5 CO5
	Mode of examination	Theory	
	Weightage Distribution	CA MTE ETE	
		25% 25% 50%	
	Text book/s*	1. Arrigo (2002) : Introduction to forensic Psychology. 2. Cooke, G. (1980) : The role of Forensic Psychologist. Chanles C. Thomas.	



		3. Howitt D : 2002 Forensic and Criminal Psycholgy. Prentic Hall Publications.	
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POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	3	3	1	2	2	2	3	3
CO2	3	3	3	2	2	3	3	3	3
CO3	3	2	1	2	2	2	1	2	2
CO4	3	3	3	3	3	3	2	3	3
CO5	3	2	1	3	2	1	3	2	3
CO6	3	3	2	3	-	3	-	3	2



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 2	
1	Course Code	FSM122	
2	Course Title	Quality Assurance and Accreditation in Forensic Sciences	
3	Credits	2	
4	Contact Hours (L-T-P)	2-0-0	
	Course Type	Compulsory	
5	Course Objective	To obtain basic conceptual knowledge of quality and their managements protocols. To obtain quality accreditations from different organizations.	
6	Course Outcomes	CO1 :: Define quality management and accreditation in FSLs CO2 :: To understand the quality assurance and audits in FSLs CO3 :: Estimate quality management requirements in FSLs CO4 :: To analyze quality technical requirements in FSLs CO5 :: Evaluate the role and importance of assessor CO6:: Gain knowledge of Agencies for setting guidelines for NABL and BIS	
7	Course Description	The course encompasses the different methods for obtaining quality standards in FSLs and how the accreditation procedures incurred. It also focusses on audits and role of assessors.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Quality Management	CO1
	A	Definition of Quality Importance of Quality Management Need of maintaining Quality in FSLs	CO1
	B	Definition of Accreditation Need and importance of Accreditation Process of Accreditation	CO1
	C	Agencies for setting guidelines for quality National Accreditation Board of Laboratories, International Laboratory Accreditation Co-operation, Asia Pacific Laboratory Accreditation Co-operation, American Society of Crime Laboratory Directors, International Organization for Standardization, Bureau of Indian Standards.	CO1,CO6
	Unit 2	Quality Management System in Forensic Science	CO2
	A	Quality Manual Quality Manager	CO2



		Total Quality			
	B	Quality Assurance Quality Control Quality Planning			CO2
	C	Internal Audits Definition Objectives Planning of audit Implementation of internal audits Follow up of corrective action Records and reports of internal audits Additional unscheduled audits.			CO2
	Unit 3	Quality Management Requirements			CO3
	A	Quality management set up in FSLs Organizational Document control			CO3
	B	Subcontracting of tests and calibrations Control of Non-conforming testing / calibration work			CO3
	C	Corrective and preventive actions Management Review			CO3
	Unit 4	Quality Technical Requirements			CO4
	A	Test and calibration methods Validation studies of new methods Measurement of uncertainty			CO4
	B	Maintenance of equipment's and calibration Evaluation of reagents and materials			CO4
	C	Sample handling and sample disposal Interpretation Total quality management, training, conferences			CO4
	Unit 5	Assessor and its Importance			CO5
	A	Role of Assessor Procedure- Assessor Assignment Assessment Procedure- New applicant laboratories			CO5
	B	On-site Assessment Pre -Assessment visit			CO5
	C	Assessor's Guide for formulating NABL recommendations Procedure- Conducting and Closing meeting			CO5,CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	
	Text book/s*	J ASiegel, P.J Saukko (2000) Encyclopaedia of Forensic Sciences Vol. I, II and III, Acad. Press.			



		<p>NABL -, Guide for Internal audit and Management Review for Laboratories.</p> <p>NABL-210, Assessor Guide Issue No.3, 1.5.2002.</p> <p>DFSS: Manuals of Forensic Sciences.</p>	
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POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	2	3	3	2	2	3	2	2
CO2	3	3	3	2	3	3	3	2	2
CO3	3	3	3	3	2	2	2	2	2
CO4	3	3	3	1	3	3	2	2	2
CO5	3	2	2	2	2	3	3	3	3
CO6	1	3	3	3	2	-	-	2	2



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 2ndSemester	
1	Course Code	FSM 123	
2	Course Title	Digital and Cyber Forensics	
3	Credits	2	
4	Contact Hours (L-T-P)	2-0-0	
	Course Type	Compulsory	
5	Course Objective	To provide students the basic knowledge and understanding of computers and its application in forensic science and the different types of computer-based crime encountered in the society and the different laws relating to it	
6	Course Outcomes	CO1: Defining the basics of computers and internet. CO2: Understanding the cyber-crime, its classification and cyber law. CO3: Determine the Investigative process in cyber forensics. CO4: Explaining the digital forensics, collection, search and seizure of digital evidences. CO5: Evaluating the laws of IPC, IEA, IT act related to digital evidences CO6: Build knowledge about latest development in the investigation of the computer crimes	
7	Course Description	This course will provide an introduction and understanding of computers and how they are engaged wholly or partly in commission of crime. With the help of this course, students will also be able to gain knowledge related to digital and cyber forensics, their investigative procedure and the legal perspective related to digital evidences.	
8	Outline syllabus		CO Mapping
	Unit 1	Basics of computer	
	A	Introduction, Computer generations	CO1
	B	Hardware- definition, types and uses, Software- definitions, types and uses	CO1
	C	Internet- basic setup Forensic utility of computer and internet	CO1
	Unit 2	Cyber crime	
	A	Definition of cyber crime Characteristic of cyber crime Motives of cyber crime	CO2
	B	Classification of cybercrime – Cybercrime against individual, Cybercrime against organization, Cybercrime against society	CO2



	C	Brief introduction to cyber law			CO2
	Unit 3	Cyber forensics			
	A	Definition, scope and importance			CO3
	B	Cyber forensics investigation process, Cardinal rules of cyber forensics			CO3,CO6
	C	Search and seizure of electronic evidence			CO3,CO6
	Unit 4	Digital forensics			
	A	Introduction, objective and methodology			CO4
	B	Role of first offender, Search and seizure of volatile and non-volatile digital evidence			CO4,CO6
	C	Types of computer forensics			CO4
	Unit 5	Legal perspective of digital evidence			
	A	Indian penal code- General idea of sections- 167, 292, 354C, 354D, 500			CO5
	B	Indian Evidence Act: General idea of Sections- 22A, 45A, 65B.			CO5
	C	IT Act- introduction, General idea of sections- 43,65,66,67.			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	
	Text book/s*	<ol style="list-style-type: none"> 1. Tewari, R.K., Sastry, P.K. and Ravikumar, K.V. (2003): Computer Crime & Computer Forensics select Publisher, New Delhi. 2. Wold, G.H: Computer Crime, T echniuques of Prevention Goyal, R.M. and Pawar, M.S. : Computer crimes. 3. Nina Godbole and Sunit Belapore; "Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley Publications, 2011. 			

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	2	2	2	2	3	3	3
CO 2	3	2	3	2	3	2	2	2	3
CO 3	3	2	1	2	2	2	3	3	2
CO 4	3	3	2	3	3	1	2	3	2
CO 5	3	2	3	3	2	2	3	2	3
CO6	3	3	3	3	2	2	1	3	3



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Semester-III
Choose any One Specialization



Specialization: Forensic Chemical Sciences

School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 3	
1	Course Code	FSM-231	
2	Course Title	Advances in Forensic Chemistry	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with forensic chemical evidences and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations	
6	Course Outcomes	CO1 :: Understand the basic techniques and procedures for forensic chemistry CO2 :: Enumerate various cases of trap, bride burning and dyes CO3 :: Assess different cases of milk, oil, fats and cosmetics. CO4 :: Summarize the chemical warfare agents, metals and alloys CO5:: Evaluate the significance of forensics in environment. CO6:: know information about latest methods of analysis used in forensic chemistry and Biomarker fingerprints of oils and petroleum.	
7	Course Description	The course “Advances in Forensic Chemistry” aims at developing basic understanding about forensic chemistry, its effect on criminal justice system and newer advances in forensic chemistry. This course encompasses relationship of forensic chemical evidence and its analysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to forensic chemistry. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the chemical evidence	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Forensic Chemistry	
	A	Introduction to Forensic Chemistry, branches of and cases involved in Forensic chemistry, preliminary and confirmatory methods used in Forensic chemistry.	CO1
	B	Analytical Chemistry: Nature and scope of analytical chemistry in Forensic chemical analysis, Concepts of Structure and function of drug molecules, Concept of Mole, Molecular Mass and Molecular Weight, Atomic Number and	CO1



		Atomic Mass, Classification of acids, bases and salts, pH value and pH scale, Buffer solutions.	
C		Oxidizing and reducing agents in organic chemistry, Functional group analysis, Schemes of identification of unknown solids, Volumetric/Titrimetric methods of analysis, Theory of indicators, Gravimetric methods of analysis, Process of precipitation, Saturated and supersaturated solution, Methods of sample preparation in organic and inorganic analytical chemistry.	CO1
	Unit 2	Forensic Chemistry-I	
A		Analysis of trap case: Mechanism of colour reaction, factor affecting the colour, detection of phenolphthalein and alkali used, method of detection of colourless solution by TLC and UV visible spectrophotometer	CO2
B		Bride burning cases and acid attack cases: Evidence collection and analysis	CO2
C		Dyes: Classification of dyes, their uses in fibre, food and pharmaceutical industries Chemical analysis and Instrumental methods of analysis.	CO2,CO6
	Unit 3	Forensic Chemistry-II	
A		Analysis of Milk product: Detection of adulterants in milk and milk products by physical, chemical and instrumental techniques	CO3,CO6
B		Oils and Fats: Chemical composition and analysis of different common oils and their adulterants by physical, chemical and instrumental technique	CO3,CO6
C		Forensic significance of Cosmetics: Introduction to cosmetics of forensic interest and their role in crime investigation, General Chemistry of Colorants Pigments & Polymers	CO3
	Unit 4	Forensic Chemistry-III	
A		Chemical warfare agents: Classification, physical and chemical properties, toxic effects, detections and protection	CO4
B		Metals and Alloys: Scope & Significance of metal and alloy analysis in forensic science. Identification & composition of metals and alloys, purity of metals including precious metals such as gold, silver and platinum. Different types of metals and alloys commonly encountered for forensic analysis. Hall marking of precious metal according to BIS	CO4,CO6
C		Cement, Mortar and Concrete: Composition, types, color spot test and instrumental analysis	CO4,CO6
	Unit 5	Environmental Forensics	
A		Definitions, background and historical aspects, need and scope	CO5



B	Arsenic, pesticides, mercury, polycyclic aromatic hydrocarbons (PAH)				CO5
C	Biomarker fingerprints of oils and petroleum, microbial forensic, radioactive tracers and dating, bioterrorism				CO5,CO6
Mode of examination	Theory				
Weightage Distribution	CA	MTE	ETE		
	25%	25%	50%		
Text book/s*	Welcher Frank; "Standard Methods of Chemical Analysis", 6 th Edition, Van Nostrand Reinhold, 1969.				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	2	2	2	3	3
CO 2	3	2	3	2	2	2	3	2	3
CO 3	3	2	3	3	2	2	2	2	2
CO 4	3	3	3	3	3	3	2	3	2
CO 5	3	2	2	3	2	3	3	3	3
CO 6	2	1	2	3	1	2	1	2	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 3	
1	Course Code	FSM-232	
2	Course Title	Advances in Forensic Toxicology	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with forensic toxicological evidences and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations	
6	Course Outcomes	CO1 :: Define the principles of toxicology CO2 :: Understand the classification of plant and animal poison CO3 :: Discuss different types of metallic and volatile poison CO4 :: To analyze the various insecticides and pesticides CO5:: Evaluate the various extraction methods used in toxicology CO6:: Create knowledge about doses, route of administration and isolation methods:	
7	Course Description	The course “Advances in Forensic toxicology” aims at developing basic understanding about forensic toxicology, its effect on criminal justice system and newer advances in forensic toxicology. This course encompasses relationship of forensic toxicological evidence and its analysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to forensic toxicology. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the toxicological evidence	
8	Outline syllabus		CO Mapping
	Unit 1	General Toxicological Principles	
	A	Introduction, History and Pioneers (Paracelsus, Mary Blandy James Marsh and M. J. B. Orfila, International organization related to Forensic Toxicology, Different mode of Classification of Poisons, Areas of Forensic Toxicology,	CO1
	B	Elements of Forensic Toxicology, Applications, Scientific Principles, Instrumentation and equipments, Nature of cases, Role of the Forensic Toxicologist, Laws related to Forensic Toxicology	CO1
	C	Dosage, different routes of administration, frequency, factors affecting drug absorption, applied analytical toxicology	CO1, CO6
	Unit 2	Plant Poison and Animal Poison	



A	Introduction to plant poison (marking nut, abrus pictorius, cannabis, datura, nux vomica, ergot, opium) fatal dose and fatal period, sign and symptoms, treatment, post mortem appearances, medio-legal significance	CO2
B	Animal poison (snake venom, canthrides, bees and wasps, scorpion), fatal dose and fatal period, sign and symptoms, treatment, post mortem appearances, medio-legal significance	CO2
C	Method of extraction and stripping of plant and animal poisons in matrices and analysis by chemical and instrumental techniques.	CO2
Unit 3	Volatile poisons and Metallic Poisons	
A	Introduction to volatile poisons, (Ethanol, methanol, aldehydes, ketones, hydrocyanic acid, chlorinated hydrocarbon, carbon dioxide, carbon monoxide, ammonia, phosphine, sulfur dioxide, hydrogen sulphide), fatal dose and fatal period, sign and symptoms, treatment, post mortem appearances, medio-legal significance	CO3
B	Heavy metal poison (Arsenic, antimony, mercury, bismuth, lead, copper), fatal dose and fatal period, sign and symptoms, treatment, post mortem appearances, medio-legal significance	CO3
C	Method of extraction and stripping of volatile and metallic poisons in matrices and analysis by chemical and instrumental techniques	CO3
Unit 4	Pesticides and insecticides	
A	Organo-chloro, organo phosphorous, fatal period, sign and symptoms, treatment, post mortem appearances, medio-legal significance	CO4
B	Carbamates and synthetic pyrethroids, fatal period, sign and symptoms, treatment, post mortem appearances, medio-legal significance	CO4
C	Method of extraction and stripping of volatile and metallic poisons in matrices and analysis by chemical and instrumental techniques.	CO4
Unit 5	Methods of Extraction	
A	Classification of matrices: biological and non-biological matrices. Modern methods of Extraction: Solid phase extraction, solid phase micro extraction.	CO5, CO6
B	Different methods of extraction for volatile and non-volatile poisons: Solvent extraction and isolation, distillation / steam distillation, micro diffusion, dialysis, dry ash, wet digestion.	CO5, CO6



C	Extraction of poison by Stass-Otto method, ammonium sulfate method from viscera, blood, urine, stomach wash and vomit, cold drink, food material and from other matrices of forensic importance.				CO5,CO6
Mode of examination	Theory				
Weightage Distribution	CA	MTE	ETE		
	25%	25%	50%		
Text book/s*	DFS -Working Procedure Manual- Toxicology A C Moffat Clarke's Analysis of Drugs and Poisons, (Formerly Isolation & Identification of Drugs) 3rd Ed. 2 Vol. Set.				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	2	2	2	3	3
CO 2	3	2	3	2	2	2	3	2	2
CO 3	3	2	3	3	2	2	2	3	2
CO 4	3	3	3	3	3	3	2	3	3
CO 5	3	2	2	3	2	3	3	2	3
CO6	2	3	2	3	1	3	1	2	2



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester:3 semester	
1	Course Code	FSM 251	
2	Course Title	Advances in Forensic Chemistry- Lab	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course objective	1. To let the student understand various practical aspects of forensic chemical evidences its identification, collection, isolation 2. To examine and analyse the evidence for serving the criminal justice system	
6	Course outcome	CO1 :: Understand identification of phenolphthalein and other constituents in trap cases CO2 :: Compare and identify various cosmetic products related to forensic CO3 :: Examine various dyes, pigment and petroleum products CO4 :: To analyse various oils and fats related to forensic CO5 :: Evaluate the consumer items like gold, silver, tobacco, tea, sugar, Salts CO6: perform analysis with the help of and UV – visible spectrophotometer.	
7	Course description	After completion of the course student will be able to know about the investigation and examination of phenolphthalein, cosmetic products, dyes, pigments, petroleum products, oils, fats, gold, silver, tobacco, tea, sugar, and salts evidences classified under forensic chemical evidences to solve various crime related investigations on-site or in forensic laboratory	
8	Outline syllabus		CO Mapping
	Unit 1	Detection and identification of phenolphthalein.	CO1,CO6
		Detection and identification of phenolphthalein and other constituents by colour test	
		Detection and identification of phenolphthalein and other constituents in trap cases by TLC	
		Identification of phenolphthalein and other constituents in trap cases by UV – visible spectrophotometry	
	Unit 2	Analysis of some important cosmetics	CO2
		Analysis of powder cosmetics	
		Analysis of Nail polish removers	
		Identification of major constituents of lipsticks	
		Physical analysis of cosmetics	



Unit 3	Analysis of Dyes, Pigments & Petroleum Products			CO3
	Identify the Dyes and pigments by the different chemical test			
	Quantification of Dyes and Pigments by the UV spectroscopy and			
	Analysis of dyes and pigment's by the TLC			
	Analysis the physical properties of petroleum Products			
	Analysis the chemical properties of petroleum Products			
Unit 4	Forensic analysis of oils and fats			CO3
	Chemical analysis of oils			
	Chemical analysis of fats			
	Identify the adulteration in the mustard and refined oil			
	Identify the adulteration in the ghee			
Unit 5	Analysis of consumer items such as, tobacco, tea, sugar, salts			CO3
	Identify the nicotine in the tobacco			
	Examine the purity of sugars			
	Examine the purity of salts			
	Identify the catechin in the tea by using of TLC			
Mode of examination	Practical/Viva			
Weightage Distribution	CA	MTE	ETE	
	25%	0%	75%	

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	2	2	2	3	3
CO 2	3	2	3	2	2	2	3	3	3
CO 3	3	2	3	3	2	2	2	2	2
CO 4	3	3	3	3	3	3	2	3	2
CO 5	3	2	2	3	2	3	3	2	3
CO6	2	3	3	2	1	1	-	3	3



School: SSAHS		Batch: 2023-25
Programme		Master of Science (Forensic Science)
Branch: FSM		Semester: 3 semester
1	Course Code	FSM 252
2	Course Title	Advances in Forensic Toxicology- Lab
3	Credits	2
4	Contact Hours (L-T-P)	0-0-4
	Course Status	Compulsory
5	Course objective	1. To let the student understand various practical aspects of forensic physical evidences its extraction, detection, separation, and identification 2. To examine and analyse the evidence for serving the criminal justice system
6	Course outcome	CO1 :: Understand extraction of poisons from viscera/blood and urine CO2 :: Identify and detect metallic poison using techniques like Reinsch test CO3 :: Examine various procedures for the separation and identification of pesticides or insecticides CO4 :: Evaluate and analyse volatile poison detection CO5 :: Inspect techniques for the identification of narcotic drugs CO6:: Know the comparative analysis of various biological fluids for the presence of toxic substances
7	Course description	After completion of the course student will be able to know about the investigation and examination of evidences like viscera/blood, urine, volatile poisons, and narcotic drugs classified under forensic toxicological evidences to solve various crime related investigations on-site or in forensic laboratory
8	Outline syllabus	CO Mapping
	Unit 1	CO1,CO6
	Extraction of poisons	
	Solvents extraction for basic drugs from blood	
	Solvents extraction for acidic drugs from blood	
	Total alcohol extraction method for plant poison	
	Wet digestion method for the extraction of heavy metal from the tissues	
	Unit 2	CO2
	Detection of Heavy Metal	
	Detect the arsenic by using of chemical test	
	Examination of lead and mercury by the chemical test	
	Chemical test for cadmium	
	Microscopic examination of heavy metals	
	Unit 3	CO3
	Identification of pesticides/insecticides	



		Chemical examination of pyrethroids			
		Chemical examination of organophosphates			
		Chemical examination of organochlorides			
		TLC analysis of different types of pesticides			
	Unit 4	Detection of Volatile poisons	CO4		
		Chemical analysis of ethanol			
		Chemical analysis of methanol			
		Chemical analysis of chloroform			
		Chemical analysis of ethanol acetone			
	Unit 5	Identification of important alkaloids	CO5		
		Analysis of cannabis by the colour test			
		Chemical examination of Dhatura			
		TLC analysis of cannabis and dhatura			
		UV spectroscopic analysis of alkaloids			
	Mode of examination	Practical/Viva			
	Weightage	CA	CE	ETE	
	Distribution	25%	25%	75%	

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	2	2	2	3	3
CO 2	3	2	3	2	2	2	3	3	2
CO 3	3	2	3	3	2	2	2	2	3
CO 4	3	3	3	3	3	3	2	3	2
CO 5	3	2	2	3	2	3	3	3	3
CO 6	2	3	2	3	2	2	1	3	3



Specialization: Forensic Biological Sciences

School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 3rd	
1	Course Code	FSM 234	
2	Course Title	Advances in Forensic Biology	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with forensic biological evidences and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations.	
6	Course Outcomes	CO1 :: Define basics of forensic biological evidences like hair and Fibre CO2 :: To Understand about botanical evidence like wood, pollens and diatoms CO3 :: Examine various forensic entomological evidences CO4 :: To analyse wildlife species, evidences and crime related to it CO5 :: Evaluate forensic microbial evidences for criminal investigation CO6:: Apply the forensic knowledge for the identification of biological and entomological evidence.	
7	Course Description	The course “Advances in Forensic Biology” aims at developing basic understanding about forensic biology, its effect on criminal justice system and newer advances in forensic biology. This course encompasses relationship of forensic biological evidence and its analysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to forensic biology. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the biological evidence	
8	Outline syllabus		CO Mapping
	Unit 1	Biological evidence	
	A	Hair-Structure, Morphology and Biochemistry of human and animal hair. Phases of hair growth and growth rate. Location, collection, microscopic examination of hair. Determination of race, gender and site or origin of hair.	CO1,CO6
	B	Fibres- definition, structure, types of fibres, difference between natural and synthetic fibre, optical properties,	CO1,CO6



		refractive index, birefringence, location, collection, microscopic examination of fibres, dye analysis.	
C		Forensic aspects of hair and fibre analysis.	CO1,CO6
Unit 2	Forensic botany		
A		Various types of wood, timber varieties, seeds and leaves-identification and matching.	CO2
B		Diatoms- Morphology, types, methods of isolation of diatoms from water, body organs and tissues. Forensic significance of diatoms (drowning cases.)	CO2
C		Pollen grains- structure, types, identification and its forensic significance. Paper and pulp identification, microscopic and biochemical examination of pulp material.	CO2,CO6
Unit 3	Forensic Entomology		
A		History, significance. Determination of time since death, dipterans larval development, life cycle of blowfly, housefly, flesh fly.	CO3,CO6
B		Collection and preservation of entomological evidence.	CO3,CO6
C		Entomotoxicology- definition, significance, identification and quantification of drugs and toxins from the insects and larvae feeding on the body, molecular methods for forensic entomology.	CO3,CO6
Unit 4	Wild life forensics		
A		Introduction and importance of wild life, protected and endangered species of animals and plants; Sanctuaries and their importance	CO4
B		Wild life species- identification and examination of wild life evidences such as skin, fur, bones, nails, horns and teeth. Pug	CO4



		marks and identification of pug marks of various animals using conventional and modern methods.			
	C	Types of wildlife crimes, different methods of killing and poaching of wildlife animals; Wildlife/ environment protection Act.			CO4
	Unit 5	Microbial forensics			
	A	Types and identification of bacteria and viruses in forensic science, microbial profiles as identification tools.			CO5
	B	Isolation, classification and identification of microbial organism.			CO5
	C	Use of microorganisms in bioterrorism, anthrax, submission of HIV as a criminal act, role of microbes in food poisoning.			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	
	Text book/s*	Forensic Biology By Richard Li ISBN 9781032098791 June 30, 2021 Forthcoming by CRC Press 568 Pages 413 B/W Illustrations			

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	3	3	2	3	3
CO 2	3	2	3	2	2	3	3	2	3
CO 3	3	2	3	3	3	2	2	2	2
CO 4	3	3	3	3	3	3	3	3	2
CO 5	3	3	2	3	2	3	3	3	3
CO 6	3	3	2	3	2	1	1	3	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 3rd	
1	Course Code	FSM 235	
2	Course Title	Advances in Forensic Anthropology and Odontology	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with forensic anthropological and odontological evidences and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting Investigations.	
6	Course Outcomes	CO1 :: Define the basics of forensic anthropological evidences like bones CO2 :: Understand, Compare and identify evidences like skull, pelvis and long bones CO3 :: Apply the methods for facial recognition used in forensic investigations CO4 :: analyse the evidences for forensic dentistry CO5:: Evaluate and inspect forensic odontological evidences for criminal investigation CO6: Apply advanced techniques for the collection and preservation of bite marks and comparison for personal identification.	
7	Course Description	The course “Advances in Forensic Anthropology and Odontology” aims at developing basic understanding about forensic anthropology andodontology, its effect on criminal justice system and newer advances in forensic anthropology and odontology. This course encompasses relationship of forensic anthropological and odontological evidence and itsanalysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to forensic anthropology and odontology. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the anthropological and odontological evidence	
8	Outline syllabus		CO Mapping
	Unit 1	Forensic Anthropology	
	A	Genesis and developments in anthropology, Brief introduction to forensic Archeology and anthropometry, principle and methods of anthropometry.	CO1



	B	Craniometry measurements, landmarks on human body. Indices- cephalic index, nasal index, total facial index	CO1
	C	Somatoscopy- somatoscopic observations of skin color, hair on head, forehead, supra orbital ridges, eye, eye brows, nose, lips, face, cheek bones and chin form etc. Method of somatotyping- Sheldon's and heath- carter's method.	CO1
	Unit 2	Determination of age, sex and stature.	
	A	Determination of Age from skeletal remains- skeletal growth, suture closure in skull and ossification in other bones.	CO2
	B	Determination of sex from skeletal remains- structure of skull, pelvis and parturition scar.	CO2
	C	Estimation of stature from skeletal remains- long bones ratio, least square regression and skeletal height etc.	CO2
	Unit 3	Forensic facial reconstruction (2-D and 3-D methods)	
	A	Portrait parle/ Bertillon system- introduction and importance of photofit/ Identi kit system for facial reconstruction.	CO3
	B	Cranio facial super imposition techniques- photographic super imposition, video- superimposition, craniometric methods in reconstruction.	CO3
	C	Importance of tissue depth to reconstruct various facial features/Genetic and congenital anomalies: causes, types, identification and their forensic significance	CO3
	Unit 4	Forensic dentistry	
	A	Development and scope, role in mass disaster and anthropology, structural variation in teeth (human and non-human), types of teeth and their functions.	CO4,CO6
	B	Determination of age from teeth: Eruption sequence, Gustafson's method, dental anomalies, their significance in personal identification	CO4,CO6
	C	Dental Charting. Comparison of Ante-mortem and post-mortem dental records.	CO4
	Unit 5	Forensic Odontology	



A	Definition and Scope of Forensic Odontology,				CO5
B	Collection and preservation of tooth samples and its examination.				CO5,CO6
C	Forensic significance, collection and preservation of bite marks, photography of bite marks, and evaluation of bite marks, Legal aspects of bite marks.				
Mode of examination	Theory				
Weightage Distribution	CA	MTE	ETE		
	25%	25%	50%		
Text book/s*	Forensic Biology By Richard Li ISBN 9781032098791 June 30, 2021 Forthcoming by CRC Press 568 Pages 413 B/W Illustrations				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	3	3	2	3	3
CO 2	3	2	3	2	2	3	3	2	3
CO 3	3	2	3	3	3	2	2	3	2
CO 4	3	3	3	3	3	3	3	2	2
CO 5	3	3	2	3	2	3	3	2	2
CO 6	3	3	3	2	1	1	1	3	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester:3 semester	
1	Course Code	FSM 253	
2	Course Title	Advances in Forensic Biology-lab	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course objective	1. To let the student understand various practical aspects of forensic biological evidences its identification, collection, comparison, and isolation. 2. To examine and analyse the evidence for serving the criminal justice system	
6	Course outcome	CO1 :: To identify human and animal hair CO2 :: To understand the examination of natural and synthetic fibre CO3 :: Apply microscopic methods for identification of pollen grains and diatoms CO4 :: To analyse entomological evidences for forensic investigation CO5 :: Evaluate the methods for isolation of Microbial strains CO6:: Identify of entomological and Microbial strains	
7	Course description	After completion of the course student will be able to know about the investigation and examination of hair, fibre, pollen, diatom, entomological, and microbial evidences classified under forensic biological evidences to solve various crime related investigations on-site or in forensic laboratory	
8	Outline syllabus		CO Mapping
	Unit 1	Examination of hair	CO1
		Microscopic examination of human hair	
		Examination and identification of animals hair	
		Identify the origin of human hair	
		Identify the medullary index of the hairs	
	Unit 2	Examination and identification of fibres	CO2
		Chemical test for the identification of natural fibre	
		Chemical test for the identification of synthetic fibre.	
		Analysis of physical characteristics of fibres	
		Burning test for fibres examination	
	Unit 3	Identification of Pollen grains and Diatoms.	CO3
		Microscopic analysis of pollen grains	
		Microscopic analysis of diatoms of ponds water	
		Microscopic analysis of diatoms of river water	



Unit 4	Examination entomological evidences. Collection, identification and life cycle study of entomological evidences.			CO4,CO6
	Collection of insects from the tissues			
	Identify the species of insects			
	Study of life cycles of selected insects			
Unit 5	Isolation and Identification of Microbial strains			CO5,CO6
	Collection of microbial from the different sources			
	Isolation of Microbial strains			
	Identification of Microbial strains			
Mode of examination	Practical/Viva			
Weightage Distribution	CA	CE	ETE	
	25%	25%	50%	

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	3	3	2	3	3
CO 2	3	2	3	2	2	3	3	2	3
CO 3	3	2	3	3	3	2	2	3	2
CO 4	3	3	3	3	3	3	3	2	3
CO 5	3	3	2	3	2	3	3	3	2
CO 6	2	3	3	3	1	2	2	3	2



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester:3 semester	
1	Course Code	FSM 254	
2	Course Title	Advances in Forensic Anthropology and Odontology –Lab	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course objective	To let the student understand various practical aspects of evidences in forensic anthropology and odontology and its identification, comparison and preservation To examine and analyse the evidence for serving the criminal justice system	
6	Course outcome	CO1 :: Understand basics of pelvic bone for gender identification CO2 :: Compare and identify evidences like skull and mandible CO3 :: Examine long bones for stature estimation CO4 :: Evaluate and analyse dental chart CO5 :: Inspect bite marks for criminal investigation CO6:: Determine the age and gender from lower jaw.	
7	Course description	After completion of the course student will be able to know about the investigation and examination of various evidences like long bones, skull and mandible, and pelvis classified under forensic anthropology and odontology to solve various crime related investigations on-site or in forensic laboratory	
8	Outline syllabus		CO Mapping
	Unit 1	To identify and determine gender from pelvic bone.	CO1
	A	Briefing	
	B	Demonstration	
	C	Practical	
	Unit 2	To identify and determine gender and age from skull and mandible.	CO2,CO6
	A	Briefing	
	B	Demonstration	
	C	Practical	
	Unit 3	Stature estimation from long bones.	CO3
	A	Briefing	
	B	Demonstration	
	C	Practical	
	Unit 4	Preparation of Dental chart	CO4
	A	Briefing	
	B	Demonstration	



C	Practical			
Unit 5	To analyse and preserve bite marks.			CO5
A	Briefing			
B	Demonstration			
C	Practical			
Mode of examination	Practical/Viva			
Weightage Distribution	CA	CE	ETE	
	25%	25%	50%	

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	3	3	2	3	3
CO 2	3	2	3	2	2	3	3	3	3
CO 3	3	2	3	3	3	2	2	3	2
CO 4	3	3	3	3	3	3	3	2	3
CO 5	3	3	2	3	2	3	3	3	3
CO 6	3	3	2	2	1	1	1	3	2



Specialization: Forensic Physical Sciences

School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 3rd	
1	Course Code	FSM 236	
2	Course Title	Advances in Forensic Physics	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with forensic physical evidences and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations.	
6	Course Outcomes	CO1 :: Define basics of forensic physical evidences like paint and glass CO2 :: Understand the evidences like soil and tool marks CO3 :: Apply the methods for various pattern evidences CO4 :: Analyse audio spectrum and videogrametry CO5 :: Evaluate and identification of speaker using instrument CO6:: Build knowledge about chemical and instrumental analysis of glass, soil and paint evidence	
7	Course Description	The course “Advances in Forensic Physics” aims at developing basic understanding about forensic physics, its effect on criminal justice system and newer advances in forensic physics. This course encompasses relationship of forensic physical evidence and its analysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to forensic physics. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the physical evidence	
8	Outline syllabus		CO Mapping
	Unit 1	Paint and glass	
	A	Introduction, Composition and Use of Paint, Types of Paint, Resins and Binders, Lacquers, Plasticizers, Water Based Polymers & Emulsions, Additives, Solvents, Pigment types, Microscopic & Macroscopic Examination,	CO1



B	Introduction to glass, types of glass and their composition-soda-lime, boro-silicate, safety glass, laminated, lightsensitive, tampered/ toughened, wire glass, coloured glass. Matching and comparison. Forensic examinations of glass fractures- rib marks, hackle marks, cone fracture, wavy, backward fragmentation, concentric and radial fractures.	CO1
C	Micro Chemical Tests, Differential Solubility and TLC, IR Spectroscopy, Pyrolysis GC-MS, Elemental Analysis of the Paints and Pigments; Colour, fluorescence, physical measurements, refractive index, density gradient, becke-line, specific gravity examination and elemental analysis of glass evidence.	CO1, CO6
Unit 2	Soil and Tool marks	
A	Introduction, Formation & Types of Soil, Composition & Colour of Soil, Types of toolmarks- compression marks, striated marks, combination of compression and striated marks, repeated marks, class characteristics and individual characteristics,	CO2
B	Turbidity test, Ph measurements, microscopic examination, density gradient analysis, ignition-loss test, tracing and lifting of marks, Photographic examination of tool marks and cut marks on wall etc.	CO2



C	Sample preparation, Removal of Contamination, Particle Size Distribution, Density Distribution, Differential Thermal Analysis (DTA), Elemental Analysis, Interpretation of Soil Evidence, Restoration of erased / obliterated marks- Method of making-cast, punch, engrave; methods of obliteration, method of restoration- etching (etchings for different metals), magnetic, electrolytic etc., recording of restored marks – restoration of marks on wood, leather, polymer etc.	CO2,CO6
Unit 3	Pattern Evidences	
A	Importance, Gait pattern, Casting of footprints in different medium, electrostatic lifting of latent footprints. Taking of control samples, Collection, tracing, lifting, casting of impressions, enhancement of footwear impressions, analysis and comparison of foot impressions, moulds, identification characteristics.	CO3
B	Nature, location, collection and evaluation of lip prints. Forensic Significance, photography, location, collection and evaluation, taking of control samples of footprints, lip prints and Ear prints for comparison. Modern techniques and developments.	CO3
C	Skid Marks: Significance, Nature, Location, Collection and Evaluation, Examination of Skid marks and Velocity Determination of Vehicle.	CO3
Unit 4	Audio-video examination	
A	Forensic audio video analysis, voltage, decibels, audio line levels, frequency measurements,	CO4
B	Spectrum analysis, noise characteristics, digital filters and audio enhancement, authentication of recorded audio, speech spectrographic analysis, magnetic developing and optical methods, Falsification in video recording,	CO4



C	Video frame sequence, method – waveform – vectroscope, videogrametry and photogrametry techniques, video image analysis, facial image recognition from video frame image	CO4
Unit 5	Forensic Speaker Identification	
A	Introduction to human Voice, Nature of voice and production of speech, perception of voice and speech, speech signal processing & pattern recognition basic factor of sound in speech acoustic characteristics of speech signal	CO5
B	Speaker Identification and Tape Authentication: Voice Production Theory, Speech Signal Processing and Pattern Recognition, Acoustic Parameters of Sound, Fourier Analysis, Frequency and Time Domain Representation of Speech Signal,	CO5
C	Analogue to Digital Conversion-Sampling and Quantization, Fast Fourier Transform, Speech Enhancement, Authentication of Audio-Video Signal.	CO5
Mode of examination	Theory	
Weightage Distribution	CA MTE ETE	
	25% 25% 50%	
Text book/s*	James, S.H and Nordby, J.J. (2003) Forensic Science: An introduction to scientific and investigative techniques CRC Press, Saferstein: Criminalistics (1976) Prentice Hall Inc., USA.	

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	3	3	2	3	3
CO 2	3	3	3	3	3	3	3	3	3
CO 3	3	2	3	3	3	2	2	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	3	2	3	2	3	3	3	3
CO 6	3	3	3	2	2	2	1	2	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 3rd	
1	Course Code	FSM 237	
2	Course Title	Advances in Digital Forensics	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with digital forensic evidences and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations.	
6	Course Outcomes	CO1 :: Describe and outline digital forensic and digital evidences CO2 :: Explain and classify cyber forensic tools and techniques CO3 :: Compare and investigate various image processing techniques CO4 :: To evaluate the database and network vulnerabilities CO5 :: Evaluate, plan and prioritize evidence collection from mobile phones and SIM card CO6:: To know about the network forensics and various investigative tools.	
7	Course Description	The course “Advances in Digital Physics” aims at developing basic understanding about digital forensic, its effect on criminal justice system and newer advances in digital forensics. This course encompasses relationship of digital forensic evidence and its analysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to digital forensic. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the digital evidence	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Digital Forensic	
	A	Introduction, Classification of Digital Crimes and Branches of Digital Forensics.	CO1
	B	Digital Evidences: Types of Digital Evidences, Acquisition, Handling and Chain of Custody.	CO1



	Evidence Imaging and File System Analysis (FAT and NTFS)	
C	Various Tools for Disc Imaging and Data Recovery (ENCASE, NUIX etc.), Vulnerability Assessment Tools. Investigations on Various Imaging Methods (RAW, SMART, E01, AFF etc.). Password and Encryption Techniques. Password Recovery Tools.	CO1
Unit 2	Cyber Forensics	
A	Introduction to Cyber Forensics – Storage fundamentals – File systems concepts – Data recovery – Cyber Forensic Investigation, Types of Cyber-Crimes. HTML and Internet Protocols, Internet History and Topology,	CO2
B	Investigation tools – eDiscovery – Digital evidence collection – Evidence presentation – E-mail investigation – E-mail tracking – IP tracking – E-mail recovery – Encryption and decryption methods – Search and seizure of computers	CO2, CO6
C	Recovering deleted evidence – Password cracking – Formatted partition recovery – Data recovery tools – Data recovery procedures and ethics - Preservation and safe handling of the original media – Chain of custody.	CO2, CO6
Unit 3	Image Processing and Video Analysis	
A	Image Processing Fundamentals, Digital Image Processing and Computer Graphics Understanding Digital Image Processing, Origins of Digital Image Processing, Examples of Fields that Use Digital Image Processing,	CO3
B	Steps in Digital Image Processing, Components of an Image Processing System, Image File Forensic: Understanding various image formats (Vector	CO3



		and Raster), and File Compression, Locating and recovering image files.Noise Analysis, Linkage of Camera.	
	C	Image Steganography, Image Forgery Detection, Detect Steganography from Image, Digital Watermark, Forensic Analysis of Multimedia Files	CO3
	Unit 4	Database and Network Forensic	
	A	Introduction to Database, Basics of SQL, Security requirements, Reliability and integrity, Sensitive data, Interface, Multilevel database, Proposals for multilevel security	CO4,O6
	B	Threats in networks, Network security control, Firewalls, Intrusion detection systems, Secure e-mail, Networks and cryptography, Example protocols: PEM, SSL, IPsec.	CO4,CO6
	C	Principles of network forensics, Attack Traceback and attributes, Critical Needs Analysis. IDS: Network based Intrusion Detection and Prevention Systems, Host based Intrusion Prevision System. Cloud Computing-Its Forensic and Security Aspects.	CO4,CO6
	Unit 5	Mobile Forensic and Cyber law	
	A	History of Mobile Phones, Types of Mobile Phones, Advantage and Disadvantages of Mobile Phones and their Forensic Applications. Operating Systems: Introduction, Objective and Types of Operating System- Java, Symbian, Window, Android and iPhone.	CO5
	B	Evidence Collection from Mobile Phones and SIM Cards. Recovering and Reconstructing of Deleted Data (call records, phone books, massages, multimedia files i.e. image, video etc.) from Mobile Phones and SIM Cards. Process of	CO5



		Cloning of SIM Data and Password Extraction from Mobile Phones.			
C		IT Act 2000 – Objectives, Applicability, Non-applicability, Definitions, Amendments and Limitations. Various cyber-crimes under Sections 43 (a) to (j), 43A, 65, 66, 66A to 66F, 67, 67A, 67B, 70, 70A, 70B, 80 etc. Along with respective penalties, punishment and fines, Penal Provisions for Phishing, Spam, Virus, Worms, Malware, Hacking, Trespass and Stalking			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	
	Text book/s*	James, S.H and Nordby, J.J. (2003) Forensic Science: An introduction to scientific and investigative techniques CRC Press,			

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	3	3	2	3	3
CO 2	3	3	3	3	3	3	3	2	2
CO 3	3	2	3	3	3	2	2	2	3
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	3	2	3	2	3	3	3	2
CO6	3	3	3	2	2	2	1	3	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 3 Semester	
1	Course Code	FSM 255	
2	Course Title	Lab- Advances in Forensic Physics	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Type	Compulsory	
5	Course Objective	<p>1. To let the student understand various practical aspects of forensic physical evidences its individualisation, characterisation, comparison and discrimination</p> <p>2. To examine and analyse the evidence for serving the criminal justice System</p>	
6	Course Outcomes	<p>CO1 :: Explain the examination methods of various paint samples</p> <p>CO2 :: Understand and identify various impression evidences</p> <p>CO3 :: Apply methods of examination for glass and soil samples</p> <p>CO4 :: Analyse tool marks and restoration of erased punched marks</p> <p>CO5 :: Evaluate and inspect forensic voice and video analysis</p> <p>CO6: Develop methods to locate and lift various impression evidence like footprint, tire marks</p>	
7	Course Description	After completion of the course student will be able to know about the investigation and examination of paint, glass, soil, tool marks, voice/speaker, video, and various impressions evidences classified under forensic physical evidences to solve various crime related investigations on-site or in forensic laboratory	
8	Outline syllabus		CO Mapping
	Unit 1	Examination of Paint Samples	CO1
		Microscopic examination of paint chips	
		Number, sequence, colour, thickness and texture of each layer in paint by using od stereoscope	
		Determine refractive index of paints	
		Micro-chemical Test for paint analysis	
	Unit 2	Analysis of Impression Evidences	CO2,CO6
		Examination of foot print	
		Analysis of byte marks on food stuff	
		Identify the types of wrinkle pattern in the lip prints	
		Tyre marks examination	



Unit 3	Examination of Glass and Soil Samples				CO3
	Identify the side of impact with fracture patterns on the glass				
	Examination of RI of glass evidence				
	Identify the density of the glass particles				
	Examine the density of soil with the other physical properties				
Unit 4	Identification and comparison of tool marks and restoration of erased punched marks on metal surface by chemical treatment				CO4
	Identify the types of tool from the tool impressions				
	Lift the tool impression				
	Comparison examination of toll marks (known and questioned)				
	Restore the serial number on keys and vehicles				
Unit 5	Speaker/Voice Identification and Authentication & Video Analysis				CO5
	Recognize the person on the basis of voice				
	Check the authenticity of voice				
	Examination of video				
Mode of examination	Theory				
Weightage Distribution	CA	CE	ETE		
	25%	25%	50%		
Text book/s*	James, S.H and Nordby, J.J. (2003) Forensic Science: An introduction to scientific and investigative techniques CRC Press, Saferstein: Criminalistics (1976) Prentice Hall Inc., USA.				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	3	3	2	3	3
CO 2	3	3	3	3	3	3	3	3	3
CO 3	3	2	3	3	3	2	2	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	3	2	3	2	3	3	3	3
CO6	3	3	3	2	1	2	2	3	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 3rd Semester	
1	Course Code	FSM 256	
2	Course Title	Lab- Advances in Digital Forensics	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Type	Compulsory	
5	Course Objective	<p>1. To let the student understand various practical aspects of digital forensic evidences its identification, extraction, collection, preservation using various tools and techniques</p> <p>2. To examine and analyse the evidence for serving the criminal justice system</p>	
6	Course Outcomes	<p>CO1 :: Identify basics of data recovery and imaging</p> <p>CO2 :: Understand techniques for tracking IP addresses</p> <p>CO3 :: To apply methods for encryption and decryption</p> <p>CO4 :: To analyse image authentication and steganography</p> <p>CO5 :: Evaluate and Plan for evidence collection and data recovery from mobile phones and SIM card</p> <p>CO6:: Recover and restore the deleted files.</p>	
7	Course Description	After completion of the course student will be able to know about the investigation and examination of evidences like data, files, images, and IP addresses classified under digital forensic evidences to solve various crime related investigations on-site or in forensic laboratory	
8	Outline syllabus		CO Mapping
	Unit 1	Recovery of Data, Copying and Imaging	CO1
		Recovering Data From Damaged Media	
		Data backup and recovery	
		Identify the source of images	
	Unit 2	Tracking of IP address	CO2
		Conversion of IP addresses	
		Configuration of IP address, Subnet Mask and default Gateway	
	Unit 3	Encrypting and decrypting files	CO3



		Computing over encrypted data (Fully Homomorphic Encryption (FHE), Functional Encryption (FE))			
		Perform encryption by using different techniques			
		Perform decryption using transposition techniques			
Unit 4		Image Authentication, Enhancement and Steganography			CO4
		Enhancing Security of Image Steganography Using Visual Cryptography			
		Digital image steganography and steganalysis			
		Data extraction and matching of images fingerprints			
Unit 5		Evidence Collection and Data Recovery from Mobile Phone and SIM card			CO5,CO6
		Examination of sim card with the technical points			
		Extract of data from sim card and lock and reset of sim card			
		Recovery of data from the mobiles			
Mode of examination		Theory			
Weightage Distribution	CA	CE	ETE		
	25%	25%	50%		
Text book/s*	James, S.H and Nordby, J.J. (2003) Forensic Science: An introduction to scientific and investigative techniques CRC Press,				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	3	3	2	3	3
CO 2	3	3	3	3	3	3	3	2	3
CO 3	3	2	3	3	3	2	2	3	2
CO 4	3	3	3	3	3	3	3	2	3
CO 5	3	3	2	3	2	3	3	3	3
CO6	2	3	3	2	2	2	1	3	3



Discipline Specific Elective: (Opt any one)

School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 3	
1	Course Code	FSM-221	
2	Course Title	Chemical Instrumental Analysis	
3	Credits	2	
4	Contact Hours (L-T-P)	2-0-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with chemical instruments and its utilization in analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations.	
6	Course Outcomes	CO1 :: To know basics of chromatographic methods CO2 :: Understand and identify working and instrumentation of nuclear magnetic resonance CO3 :: Apply various working and instrumentation of ion mobility spectrometry, neutron activation analysis and raman spectroscopy CO4 :: To analyze various components and working and instrumentation of x-ray spectrometry CO5 :: Evaluate various instruments its working and components like auger emission spectroscopy, cyclic voltammetry and potentiometry CO6:: Build knowledge about functioning of Mass spectrometry, MC-ICP-MS and Raman Spectroscopy	
7	Course Description	The course “Chemical Instrumental Analysis” aims at developing basic understanding about chemical instrumental analysis, its utilization in criminal justice system and newer advances in chemical instrumental analysis. This course encompasses relationship of chemical instrumental analysis and its utilization for crime investigation resourceful to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to chemical instrumental analysis. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the modern and applied forensic studies	
8	Outline syllabus		CO Mapping
	Unit 1	Chromatographic Methods	CO1
	A	Chromatographic: Introduction, Review of basic principles and Classification of chromatographic techniques, Normal and Reverse Phase chromatography.	CO1



B	Ion Chromatography: Basic Principle, Instrumentation, working and Forensic applications Pyrolysis gas Chromatography: Basic Principle, theory, instrumentation, working and Forensic applications. Ultra-Performance Liquid Chromatography: Basic Principle, theory, instrumentation, working and Forensic applications	CO1
C	Analytical Protocols: Sample preparation and interpretation of Chromatogram, Forensic applications of MS with special reference to hyphenated techniques.	CO1
Unit 2	Spectroscopy-I	CO2
A	Nuclear Magnetic Resonance (NMR): Basic Principle, Properties of Nuclei, Width of Absorption Lines, Chemical shifts, Spin-spin coupling, Instrumentation, Analytical Protocols and Forensics	CO2
B	Mass Spectrometry: Basic Principle and Theory, Instrumentations. Techniques: Resolution, Resolving power and Mass Accuracy, Vacuum systems, Ionization types (CI-MS, EI-MS, ECNI, FI,APCI), Mass analyzers (Transmission Quadrupole, Quadrupole Ion trap, Time of Flight & DoubleFocusing), Scanning modes (SIM and SCAN), Tandem Mass Spectrometry and MALDI-TOF.	CO2,CO6
C	Stable Isotope Ratio Mass Spectrometry: Introduction, Basics of mass spectrometry, Gas source (Stable isotope), Static gas (noble gas), Solid source (Radiogenic isotope) Mass spectrometry, Multiple Collector Inductively Coupled Plasma Mass Spectrometry (MC-ICP-MS) – Moving wire Isotope Ratio Mass Spectrometry), Accelerator Mass Spectrometry, Geological, food, biochemical, pharmaceutical and forensic applications	CO2,CO6
Unit 3	Spectroscopy-II	CO3
A	Ion Mobility Spectrometry: History, Ion mobility, Instrumentation, Ionization, Analyzers Drift gas detector, Ion traps, Hyphenated ion mobility spectrometry (GC-IMS, IMS-MS, LC- IMS, LCIMS-MS) and their Applications.	CO3
B	Neutron Activation Analysis: Principles, Theory, Instrumentation- Various Neutron Sources, Detection and Measurement of Gamma-Rays for Qualitative, Quantitative Analysis and Forensic Applications.	CO3
C	Raman Spectroscopy & Surface Enhanced Raman Spectroscopy (SERS): Basic Principle, theory, instrumentation, working and Forensic applications	CO3,CO6



Unit 4	Spectroscopy-III				CO4
A	Elements of X-ray spectrometry, X-ray absorption and fluorescence, Energy Dispersive X-ray Analysis (EDX) : Basic Principle, theory, instrumentation, working and Forensic applications				CO4
B	Wavelength Dispersive X-ray analysis (WDX) : Basic Principle, theory, instrumentation, working and Forensic applications				CO4
C	X-ray diffraction : Basic Principle, theory, instrumentation, working and Forensic applications				CO4
Unit 5	Miscellaneous				CO5
A	Auger emission spectroscopy : Basic Principle, theory, instrumentation, working and Forensic applications				CO5
B	Cyclic Voltammetry : Basic Principle, theory, instrumentation, working and Forensic applications				CO5
C	Potentiometer : Basic Principle, theory, instrumentation, working and Forensic applications				CO5
Mode of examination	Theory				
Weightage Distribution	CA	MTE	ETE		
	25%	25%	50%		
Text book/s*	James R et al. (2005) Undergraduate Instrumental Analysis Borrow (1980) Molecular Spectroscopy Skoog, D.A., Holler, F.J. and Crouch, S.R., 2017. Principles of instrumental analysis. Cengage learning. Willard, H.H., Merritt Jr, L.L., Dean, J.A. and Settle Jr, F.A., 1988. Instrumental methods of analysis.				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	2	3	3	2	2	2	3	2
CO2	3	2	3	2	2	2	3	2	3
CO3	3	2	3	3	2	2	2	3	3
CO4	3	3	3	3	3	3	2	3	2
CO5	3	2	1	3	2	3	3	3	3
CO6	2	3	3	2	1	1	1	2	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 3	
1	Course Code	FSM-222	
2	Course Title	Bank Frauds & Forensic Accounting	
3	Credits	2	
4	Contact Hours (L-T-P)	2-0-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with the evidences in Bank Frauds & Forensic Accounting and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations.	
6	Course Outcomes	CO1 :: To know basics of accounting principlesevidences like alcoholic and non-alcoholic beverages. CO2 :: Understand and identify about fraud investigation and money laundering CO3 :: To Apply the methods for collecting evidences in bank frauds and its investigation CO4 :: To analyze various reports and litigation CO5 :: Evaluate intellectual property rights related to bank frauds & forensic accounting CO6::Gain knowledge of investigation procedure in document frauds of banking and other cooperate sectors.	
7	Course Description	The course “Bank Frauds & Forensic Accounting” aims at developing basic understanding about bank frauds & forensic accounting, its effect on criminal justice system and newer advances in bank frauds & forensic accounting. This course encompasses relationship of bank frauds & forensic accountingevidence and its analysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to bank frauds & forensic accounting. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of bank frauds & forensic accounting evidences	
8	Outline syllabus		CO Mapping
	Unit 1	Basic Accounting Principles	CO1
	A	Types of companies and role of key managerial personnel, Basic accounting principles. Types of banks, Bank instruments-legal tenders, bank notes,FDRs,Cheques/drafts, Bank guarantee, Bonds and certificates.	CO1



B	Types of accounts –Saving account, Current account, account opening forms, credentials of introducers, guarantor, D Mat accounts, Public Provident fund, Recurring Deposits, and special accounts, Alterations in Pass Books	CO1
C	Credit Debit/ATM card frauds, Ledger entries, Withdrawal slips, Cheques, Documents for loan, Bank guarantee, Corporate frauds and banking frauds-Case studies.	CO1
Unit 2	Fraud Investigation-I	CO2,CO6
A	Difference between audit and investigations, skills of a fraud investigator, conducting fraud investigation.	CO2,CO6
B	Investigation of external fraud schemes-corporate espionage, investment schemes, pyramid or Ponzi schemes, securities fraud, hidden income or assets, insurance fraud and bankruptcy fraud, evaluating frauds, fraud deterrence, money laundering, types of money laundering..	CO2,CO6
C	Case studies., investigative techniques- corporate background checks, individual background checks, digital data analysis, computer forensics, interviewing witnesses and suspects, confirmation with customers and vendors. File maintenance and professional standards.	CO2,CO6
Unit 3	Fraud Investigation-II	CO3,CO6
A	Investigation of asset misappropriation schemes- cash receipt schemes, disbursement schemes.	CO3,CO6
B	Non-cash schemes- investigation of financial statement frauds, revenue overstatement, asset overstatement, liability and expense understatement, reserve manipulation, misrepresentation or omission of information, improper recording of mergers and acquisitions, off- balance sheet items	CO3,CO6
C	Forensic data analytics and tools available for background checks. Scrutiny of forensic documents. Fraud deterrence. Forensic discovery and analysis of digital evidence	CO3,CO6
Unit 4	Reporting and Litigation	CO4
A	Background information, Investigation procedures, opinion, attachments, draft reports.	CO4
B	Preparing for testimony, Deposition testimony, Trial testimony & other issues in moving forward as a company	CO4
C	Preventing future frauds, marketing a fraud investigation practice, Litigation processes and examination of financial records.	CO4
Unit 5	Intellectual Property Rights	CO5
A	Introduction to Intellectual Property Rights, Conventions and Treaties relating to Global Administration of IPR, Jurisdiction Enforcement and Administration of IPRs.	CO5



B	Law of Intellectual Property and Ethical Issues, IPR in India and Abroad, Introduction to Copyrights as forms of Intellectual Property				CO5
C	Issues in Cyber Space – Interface with Copyright Law, Trademarks & Domain Names Related Issues, Metatags, Linking, Framing, Adwords and Trademark Infringement.				CO5
Mode of examination	Theory				
Weightage Distribution	CA	MTE	ETE		
	25%	25%	50%		
Text book/s*	<p>Manning, G.A. and CFE, E., 1999. Financial investigation and forensic accounting. CRC Press.</p> <p>Singleton, T.W., Singleton, A.J., Bologna, G.J. and Lindquist, R.J., 2006. Fraud auditing and forensic accounting. John Wiley & Sons.</p> <p>Kranacher, M.J. and Riley, R., 2019. Forensic accounting and fraud examination. John Wiley & Sons.</p>				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	2	3	3	2	2	2	3	3
CO2	3	2	3	2	2	2	3	2	3
CO3	3	2	3	3	2	2	2	3	2
CO4	3	3	3	3	3	3	2	3	3
CO5	3	2	1	3	2	3	3	2	3
CO6	3	3	2	3	2	3	2	3	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 3	
1	Course Code	FSM223	
2	Course Title	Road Accident Investigation and Insurance Claims	
3	Credits	2	
4	Contact Hours (L-T-P)	2-0-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with the evidences in road accident investigation and insurance claims and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations.	
6	Course Outcomes	CO1 :: to know basics of road crash investigation CO2 :: Understand and identify evidences of traffic accidents CO3 :: Apply and identify evidences in cases of motor insurance policies CO4 :: analyze various vehicle insurance and liabilities CO5 :: Evaluate and inspect road accident scene and its reconstruction CO6:: Know about Legal provisions of Motor Vehicle act and evaluation of evidence related to road accident cases.	
7	Course Description	The course “Road Accident Investigation and Insurance Claims” aims at developing basic understanding about road accident investigation and insurance claims, its effect on criminal justice system and newer advances in road accident investigation and insurance claims. This course encompasses relationship of road accident investigation and insurance claim evidences and its analysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to road accident investigation and insurance claims. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the road accident investigation and insurance claim evidences	
8	Outline syllabus		CO Mapping
	Unit 1	Road Crash Investigation	CO1
	A	Process and Provisions- Objectives, Responsibilities of the Investigation Officer at the Scene, series of events description, Legal provisions of MV Act with recent amendments and Judicial pronouncement in case of accidents. Drafting of FIR in Accident cases	CO1,CO6



B	Investigation Procedures: Expert Response required at the scene and their specific roles. Protecting the scene, caring for the injured, searching the scene and vehicular, recording the scene: photography and measuring and sketching the accident scene, collection of evidences	CO1,CO6
C	Questioning and interviewing the Drivers and witnesses; Types of personal protective equipment (PPE) and its applications in road collision investigations.	CO1
Unit 2	Evidence Evaluation	CO2,CO6
A	Evaluation of Road environment, vehicle and human being, Highway damage, Fingerprints, soil, paint, glass and blood, Vehicle damage, tire marks, skid marks, sideslip marks, yaw marks, debris, and mechanical inspection of the vehicle	CO2,CO6
B	examination of accelerator, brake system, body damage of vehicle, exhaust system, gear shift lever, horn, lights, loads, mirrors, safety restraint systems, air bags, steering and suspension systems, windshield, windows and wiper conditions	CO2,CO6
C	Assessing the injury patterns in accident cases, victim identification and post mortem findings. Reconstruction of Accident cases, Estimation of speed,Introduction to speed estimates, coefficient of friction, speed from skid marks	CO2,CO6
Unit 3	Motor Insurance Policies	CO3
A	Types of motor policies – Liability only and package policies and coverages there under- Policy conditions – Motor trade policies, Motor insurance practice- Rules and regulations- Add on covers- Documents- Proposal form – Certificate of insurance and cover note- Policy forms – Endorsements and renewal notice, Underwriting and rating – No claim discount.	CO3
B	Insurance Surveyor and Investigation of Claim: Role of surveyor and loss adjustor; Licensing authority and controller of insurance; Empanelment of surveyor; Claim Procedure Intimation, Site visit, Garage visit, Checking of documents (Paper pertaining to claim), Photography, Estimate and claim form, Passing of estimate (i) Cost of parts (ii) Cost of repairing (iii) Labour.	CO3
C	Preparation of survey reports and submission; Various types of loss assessment; Important aspects of survey; Fraud claims; Connected to MACT	CO3



	Unit 4	Vehicle insurance and Liability			CO4
	A	Vehicle Insurance: history and development of insurance; Act liability only; Third party only; Comprehensive policy; Policies with Zero Depreciation Option; Policy term and condition			CO4
	B	Liability: Types of motor vehicles- private cars, motor cycle/ scooters, commercial vehicles, trailers, miscellaneous and specific types of vehicles- Legal aspects, Requirements for compulsory third party insurance certificate of insurance – Liability without fault – Compensation on structure formula basis- —Hit and Run Accidents Solatium fund – Motor accident claims tribunals – Lok Nayalaya- Jald Rahat Yojana- International practice in third party insurance.			CO4
	C	Insurance Claims- Claim (own damage) Documents and procedures- Types of losses – Claims (third party liability) – Legal and procedural aspects- Control of frauds , Motor third party pool- Objectives and procedures.			CO4
	Unit 5	Reconstruction of accident			CO5
	A	overview of reconstruction software and techniques, computer aided design techniques,			CO5
	B	vehicle specification databases, momentum and energy analysis program,			CO5
	C	collision simulators, photogrammetry software			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	
	Text book/s*	Brach, R.M. and Brach, R.M., 2011. Vehicle accident analysis and reconstruction methods. Noon, R.K., 2000. Forensic engineering investigation. CRC Press. Crumbley, D.L., Heitger, L.E. and Smith, G.S., 2007. Forensic and investigative accounting. CCH.			



Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	2	3	3	2	2	2	3	3
CO2	3	2	3	2	2	2	3	2	2
CO3	3	2	3	3	2	2	2	2	2
CO4	3	3	3	3	3	3	2	2	3
CO5	3	2	1	3	2	3	3	3	2
CO6	3	3	3	3	2	3	2	2	2



School: SSAHS		Batch: 2023-25
Programme		Master of Science (Forensic Science)
Branch: FSM		Semester: 3rd semester
1	Course Code	FSM224
2	Course Title	Faculty Student Industry Connect (FSIC)/Industrial Training
3	Credits	2
4	Contact Hours (L-T-P)	0-0-4
	Course Status	Compulsory
5	Course Objective	To create a platform to enhance the industry-academia interaction To give exposure to the industry to our faculty members and students To bridge the gap between industry and academia
6	Course Outcomes	CO1: Enhanced role of the university across industries in the form of knowledge creation, learning, training, consultancy CO2: To give real-time exposure to our faculties about industry environment CO3: Developing an understanding of various real-time problems, latest updates, technological advancements, and best practices of the industry CO4: Establishing corporate connections and strong networking CO5: To make our students industry-ready.
7	Course Description	The university offers a Faculty-Student Industry Connect (FSIC) course for the holistic development and empowerment of students and faculties to gain more practical insights and exposure to the industry. FSIC will support the curriculum by amplifying, supplementing, and filling in the gaps related to industry exposure, if any. In addition, FSIC will help students and faculty to enrich their knowledge and skills about the various practices of the industry by making industry visits, working on live projects with the industry, and solving the real-time problems of the industry.
8	Outline syllabus	

Guidelines:

For Students:

1. It is mandatory for every student to get registered for the two-credit FSIC course offered by the school/department.
2. Students pursuing UG programs are required to enroll in this course in the 2nd or 3rd year.
3. Students pursuing PG programs are required to enroll in this course in the 2nd or 3rd semester.
4. Attendance for a minimum of two visits to the same industry/organization will be marked as a requisite for the completion of the FSIC course. Students will be required to submit geotagged pics for both visits.
5. As FSIC is a two-credit course, it is essential for students to clear/complete the FSIC course.



6. A student shall be graded for the FSIC course.
7. If a student fails in the FSIC course, the student will get the grade “F” and need to repeat the course with the succeeding batch. Only final-year students will be allowed to appear in the summer batch.
8. The student shall be issued a course completion certificate by the school/department after Passing the course.

II. For School/Department:

1. Individual schools/departments must appoint an FSIC coordinator for the smooth Functioning of the FSIC course at the school/departmental level.
2. The FSIC is mandatory for all the non-council courses but even then for council based courses this course may be given as Value Added Course (VAC)
3. The school/department FSIC coordinator should ensure students’ enrolment in the FSIC course.
4. Industry/organization visit slots must be mapped on the timetable. The slot can be given on iCloud if the specific visit by any team should be intimated to the FSIC coordinator, one week in advance.
5. The FSIC coordinator will allot a minimum of 2-3 students to every faculty member of the school/department.
6. The FSIC coordinator will ensure that every faculty member with their allotted students must visit a minimum twice the same industry/organization to get better insights into the industry/organization.
7. The school/department should get it mapped FSIC on PeopleSoft.
8. FSIC course details along with an evaluation scheme must be designed for this course.
9. For the FSIC course, course outcomes (COs) must be created and mapped with POs & PSOs of the program. Approval is required from the Office of the Dean of Academic Affairs.
10. FSIC brochure must be prepared by the school/department.
11. Attendance records and assessment records should be maintained properly and on a regular basis.
12. The school/department FSIC coordinator must inform students about the requisites (regular attendance and passing the exam) for the completion of the course.
13. On completion of the course, students will be issued a course completion certificate.
14. The FSIC Course Execution Process.

Evaluation Scheme:

The evaluation scheme of the FSIC course will be as follows:

Continuous Evaluation (CE)	Industry Visit Report	Viva - Voce	Total
80 %	10 %	10 %	100 %



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Semester-IV

(Specialization Continuation)



Specialization: Forensic Chemical Sciences

School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester:4	
1	Course Code	FSM241	
2	Course Title	Modern and Applied Forensic Chemistry	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with the evidences in modern and applied forensic chemistry and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations.	
6	Course Outcomes	CO1 :: To know basics of modern and applied forensic chemical evidences like alcoholic and non-alcoholic beverages CO2 :: Understand and identify evidences like petroleum products CO3 :: Apply various methods of collecting evidences in cases of fire and arson investigation CO4 :: To analyze various drugs using physico-chemical instruments CO5 :: Evaluate and inspect clandestine laboratory investigation and various drug of abuse in sports and designer drugs CO6:: Create understanding about the quantitative analysis of alcoholic beverages and drugs.	
7	Course Description	The course “Modern and Applied Forensic Chemistry” aims at developing basic understanding about modern and applied forensic chemistry, its effect on criminal justice system and newer advances in modern and applied forensic chemistry. This course encompasses relationship of modern and applied forensic chemical evidence and its analysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to modern and applied forensic chemistry. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the modern and applied forensic chemical evidences	
8	Outline syllabus		CO Mapping
	Unit 1	Analysis of Alcoholic & Non- alcoholic beverages	
	A	Analysis of various types of denaturants of alcohols, country made liquor, illicit liquor, medicinal preparations and liquor of forensic importance as per BIS specifications. Pharmacology and Toxic properties and effects of alcohol	CO1



B	Qualitative and Presumptive chemical tests for alcohol in blood and urine including Breath Alcohol Screening devices	CO1,CO6	
C	Quantitative analysis: Method of analysis of some alcoholic beverages in biological materials by chemical methods (Kozelka- Hine) and instrumental methods (GC), Legal context to drinking and driving	CO1,CO6	
Unit 2	Petroleum Products and their Adulteration		
A	Chemical composition of various fractions of Petroleum Products, Marketing Disciplinary Guidelines for sampling of petrol and diesel.	CO2	
B	Analysis of petrol, kerosene, diesel, lubricants by BIS methods and ASTM methods	CO2	
C	Detection of adulterants of Gasoline, Diesel and Engine oils. Analysis of adulterants in forensic exhibits by Gas Chromatography, Analysis of dyes of Petrol, Kerosene and Engine oils. Essential Commodity Act & Petroleum Act.	CO2	
Unit 3	Fire and Arson		
A	Fire: Light and Flame, Chemistry of Fire, Combustion reaction, Fire Triangle, Fire Tetrahedron; Backdraft, Thermo-chemistry of Fire, Heat Capacity and Phase changes, Accelerants & types of accelerants, Combustible and Flammable liquids, Flash point, Fire point, Ignition point, Auto Ignition point, vapour density, vapour pressure, Fire extinguisher.	CO3	
B	Arson: Legal Definition, Arson motives, Degrees of Arson, Forensic and legal Concepts, determining origin and cause; Fire patterns, Collection/Preservation of Arson Evidences, Flashover, Back draught, Live or dead at time of arson; Documenting the fire or crime scene	CO3	
C	Analytical Methods: Extraction of samples from debris (Direct and solvent extraction methods, Head Space method, SPME, Distillation), Clean-up (Filtration & Acid stripping), Analysis (GC, GC-MS, FTIR & SEM etc.), Interpretation of GC-MS spectra.	CO3	
Unit 4	Forensic Analysis of Drugs-I		
A	Drug: Definition of Drug, Drug Use & Misuse, Drug Dependence and chemistry of Addiction, Drug Receptors and Brain Chemistry.	CO4	



		Drugs of Abuse: Definition, Classification based on Form and Origin, Use, Effects and Schedules, Structure of NDPS Act and the definitions of each drug classification, Drugs as Evidence, Profiling Examples of Illegal Drugs, United Nations International Drug Control Programme.			
	B	Chemistry and Analysis of Drugs of Abuse: Origin, Pharmacology, Methods of preparation, Storage, Diluents and Adulterants, Sample Handling, Optimization of Experimental Conditions,			CO4,CO6
	C	Presumptive/Screening and Confirmatory Methods: Color/spot test, Microscopic examination, Microcrystalline tests, Thin-Layer Chromatography, Sample Preparation before TLC Specimen, Extraction, Evaluation of TLC for Drug Screening, Immunoassay Methods, UV Spectrophotometry, IR/FTIR Spectrophotometry, NMR, GC-MS & HPLC/LC-MS, Legal Implications and Data Interpretation of Opium and Opioids analgesics, Stimulants (Cocaine, Amphetamine & other amphetamine derivatives), Depressants (Barbiturates and Benzodiazepines), Hallucinogens (Cannabis, LSD, Psilocybine and Mescaline), OTC, Inhalant and Volatile Substances, Drugs in sexual assault			CO4,CO6
	Unit 5	Forensic Analysis of Drugs-II			
	A	Clandestine laboratory: Meaning and Definition of Clandestine, Clandestine Laboratory, Related Problems, Factors Contributing to Clandestine Drug Labs, Harms Caused by Clandestine Drug Labs			CO5
	B	Designer drugs: Definition, Analogs of Fentanyl and Meperidine (both synthetic opioids), Phencyclidine (PCP), Amphetamines and methamphetamines (which have hallucinogenic and stimulant properties).			CO5
	C	Drug Abuse in Sports: Introduction, International Olympic Committee (IOC), World Anti-Doping Agency (WADA), classification of commonly prohibited substances and Performance enhancing Drugs, Steroids, Stack and Pyramid methods, Dope test and Blood Doping, Sampling techniques, analytical approaches.			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	



Text book/s*	Clark, E.G.C. : Isolation and identification of Drugs, VI and Vol. II, 1966, 1975-1986. Modi, Text Book of Medical Jurisprudence Forensic Medicines and Toxicology (1999) CBS Pub. New Delhi	
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POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	2	2	2	3	3
CO 2	3	2	3	2	2	2	3	2	3
CO 3	3	2	3	3	2	2	2	3	2
CO 4	3	3	3	3	3	3	2	3	2
CO 5	3	2	2	3	2	3	3	2	3
CO6	2	3	2	2	1	3	2	3	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 4th	
1	Course Code	FSM 242	
2	Course Title	Advances in Forensic Pharmacology	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with forensic pharmacological evidences and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations.	
6	Course Outcomes	CO1 :: define the field of basic drug activity CO2 :: understand the scope and objectives of dose and relationships CO3 :: To apply and estimate the dose repose value with pharmacokinetic studies CO4 :: Analyze the importance of pharmacodynamics in relation to forensic science CO5 :: Evaluate the different laws related to drug CO6:: Analyze the Physico – chemical properties of drug molecules and concept of dose dependency.	
7	Course Description	The course “Advances in Forensic Pharmacology” aims at developing basic understanding about forensic pharmacology, its effect on criminal justice system and newer advances in forensic pharmacology. This course encompasses relationship of forensic pharmacological evidence and its analysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to forensic pharmacology. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the pharmacological evidence	
8	Outline syllabus		CO Mapping
	Unit 1	Basic Consideration of Drug Activity	CO1
	A	Definition, origin and nature of pharmaceutical legislation in India, scope and objective, report of commission, new drug policy	CO1
	B	Physico – chemical properties of drug molecules in relation to biological activity- solubility, lipohilicity, partition-coefficient, ionization	CO1,CO6



	C	Hydrogen bonding, chelation, redox potential and surface activity	CO1,CO6
	Unit 2	Dose-response relationship	CO2,CO6
	A	Dose, response, models, dose- Response modelling	CO2,CO6
	B	NOAEL approach to derive health base guidance value	CO2,CO6
	C	Lethal dose 50 and effective dose 50, lethal period	CO2,CO6
	Unit 3	Pharmaco/toxicokinetics	CO3
	A	Drug absorption, distribution, bio-transformations and excretion	CO3
	B	pharmacokinetic concepts of bioavailability, apparent volume of distribution (aVd), half life ($t_{1/2}$), and clearance (CL)	CO3
	C	Forensic pharmacokinetics/toxicokinetics: pharmacokinetics, metabolism pathways of common drugs and poisons, Drug toxicity, excretion of drugs and poisons	CO3
	Unit 4	Pharmacodynamics	CO4
	A	Site and mechanism of drug action, drug receptors and receptor regulation	CO4
	B	Concepts of agonists, antagonists, partial agonist and inverse agonist drugs	CO4
	C	Adverse drug reaction leading to medico-legal issues, role of pharmacovigilance activity in ADR monitoring	CO4
	Unit 5	Pharmaceutical jurisprudence	CO5
	A	Drugs and Cosmetics Act, 1940 & Rules 1945 & amendments, Poisons Act 1919	CO5
	B	The Drugs and Magic Remedies act, 1954, Narcotic Drugs and Psychotropic Substances Act, 1985	CO5
	C	Pharmaceutical ethics, clinical trials, case studies related to pharmaceutical jurisprudence.	CO5



Mode of examination	Theory				
Weightage Distribution	CA	MTE	ETE		
	25%	25%	50%		
Text book/s*	CLINICAL PHARMACOLOGY by CYNTHIA WEBSTER, CRC PRESS BASIC PHARMACOLOGY by MARIA A. HERNANDEZ, PH.D., APPU RATHINAVELU, PH.D., CRC PRESS				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	3	3	3	3	3	2	2	2
CO 2	3	2	3	2	3	3	3	2	3
CO 3	3	2	3	3	2	2	2	3	2
CO 4	3	3	3	3	3	3	2	2	2
CO 5	3	2	2	3	2	3	3	2	2
CO6	1	2	2	1	1	1	1	2	2



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester:4	
1	Course Code	FSM 261	
2	Course Title	Advance Forensic Chemistry and Pharmacology Lab	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course objective	1. To let the student understand various practical aspects of forensic chemical and pharmacological evidences and its extraction, identification, detection 2. To examine and analyse the evidence for serving the criminal justice system	
6	Course outcome	CO1 :: define blood alcohol concentration CO2 :: To understand, compare and identify drug/poison and their extraction procedures CO3 :: Apply methods for detecting drugs using UV-spectrometry CO4 :: Analyse drug detection using FTIR CO5 :: Evaluate and inspect counterfeit drug detection and their concentration usingspecific procedures CO6: Build knowledge about the use of instruments for analysis of drugs.	
7	Course description	After completion of the course student will be able to know about theinvestigation and examination of evidences like blood alcohol concentration, and drugs/poisons classified under forensic chemistry and pharmacological evidences to solve various crime related investigations on-site or in forensic laboratory	
8	Outline syllabus		CO Mapping
	Unit 1	Blood Alcohol Concentration	CO1
		Identify the blood alcohol concentration by using blood alcohol analyser	CO1
		Perform the chemical test for alcohol	CO1
	Unit 2	Extraction procedures for Drug/Poisons	CO2
		Organic extraction for acidic drugs	CO2
		Organic extraction for basic drugs	CO2
		Organic extraction for neutral drugs	CO2
	Unit 3	Detection of Drug from forensic matrix using UV-Spectrometry	CO3,CO6
		Identification of benzodiazepine from the blood	CO3
		Identification of barbiturates form the blood	CO3
		Identification of paracetamol from the blood	CO3



Unit 4	Detection of Drug from forensic matrix using FTIR			CO4,CO6
	Identification of benzodiazepine from the blood			CO4
	Identification of barbiturates form the blood			CO4
	Identification of paracetamol from the blood			CO4
Unit 5	Detection and determination of Counterfeit Drugs			CO5
	Detection of adulteration in the counterfeit drugs by chemical test			CO5
	Detection of adulteration in the counterfeit drugs by TLC			CO5
				CO5
Mode of examination	Practical/Viva			
Weightage Distribution	CA	CE	ETE	
	25%	25%	50%	

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	3	3	3	3	3	2	2	2
CO 2	3	2	3	2	3	3	3	2	2
CO 3	3	2	3	3	2	2	2	2	3
CO 4	3	3	3	3	3	3	2	3	2
CO 5	3	2	2	3	2	3	3	3	3
CO6	2	2	2	1	1	1	1	3	3



Specialization: Forensic Biological Sciences

School: SSAHS		Batch: 2023-25	
Programme FSM		Master of Science (Forensic Science)	
Branch: FSM		Semester: 3rdSemester	
1	Course Code	FSM 243	
2	Course Title	Forensic Serology and Genetics	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with forensic genetics and serological evidences and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations.	
6	Course Outcomes	CO1 :: To know basics of forensic serological evidences like blood and other body fluids. CO2 :: To understand and identify evidences serogenetic markers identification and individualisation CO3 :: Apply methods for various body fluids like saliva, sweat, milk, urine, fecal matter, vaginal secretions CO4 :: analyse immunological studies for forensic purposes CO5 :: Evaluate and inspect forensic genetics for criminal investigation Co6:: Know the methods for collection and analysis of blood and other biological fluids.	
7	Course Description	The course “Forensic Genetics and Serology” aims at developing basic understanding about forensic genetics and serology, its effect on criminal justice system and newer advances in forensic genetics and serology. This course encompasses relationship of forensic genetics and serological evidence and its analysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to forensic genetics and serology. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the genetics and serological evidences	
8	Outline syllabus		CO Mapping
	Unit 1	Forensic Serology – Introduction	



A	Blood: Composition and functions, collection and species identification. Human Blood groups: General Principles, theory of their inheritance, Blood stain pattern interpretation and significance, Identification of menstrual blood, amniotic fluid and parturition stains.	CO1
B	Collection and preservation of blood, Identification of blood by chemical- Biochemical- Crystal-Chromatographic Spectroscopic methods, Blood grouping from stains of blood by Absorption inhibition, Absorption-elution and mixed agglutination techniques. Secretor and non-secretor status.	CO1,CO6
C	Determination of origin of species by immunological methods. (ring test, single diffusion in one dimension and two-dimension, double diffusion in one dimension and two dimensions, immune electrophoresis, Rocket immune-electrophoresis, Two dimensional electrophoresis, cross-over electrophoresis, precipitin-inhibition test, mixed agglutination method)	CO1,CO6
Unit 2	Serogenetic Markers	
A	Introduction of blood groups- History- Biochemistry and genetics of ABO, MN, Rh, Lewis, Lutheran, Kidd, Duffy and P systems.	CO2
B	Serum proteins- Km-Gm- Hp- Gc- Transferrin-LDHPCE- Cellular proteins- PGM-AK-ADA-PepA-EsD-GLO-GPT-G6PD- Haemoglobin variants- Hbf – Hbs – Hbc – HbA	CO2
C	Determination of sex and race from blood- White blood group system HLA and its forensic significance. Non-genetic approaches to individualization- biochemical profiling, antibody profiling	CO2,CO6
Unit 3	Other Body Fluids	
A	Semen: Forensic significance, location, collection, evaluation and tests for identification. Distinguishing vaginal acid phosphatase and seminal acid phosphatase using isoelectric focusing techniques.	CO3
B	Composition, functions and forensic significance of saliva, sweat, milk, urine, fecal matter, vaginal secretions and tests for their identification including the presence of blood group specific ABH substances, Collection and preservation of saliva, urine, faeces, milk samples.	CO3,CO6



C	Poly morphic enzymes: Forensic significance, identification from fresh blood and stains. Paternity disputes: Causes, Various serological and biochemical methods, calculation of paternity index and probability for paternity and maternity.			CO3,CO6
Unit 4	Immunology			
A	Immunology: Immune system, immune response, innate and acquired immunity and antigens, haptenes and adjuvants. Lectins: Forensic significance, buffers and serological reagents, methods of sterilization employed for serological work.			CO4
B	Immunoglobulin: Types, physio-chemical properties and function, raising of antisera.			CO4
C	Antigen-Antibody Reactions: Precipitation, agglutination, complement, neutralization, immunofluorescence			CO4
Unit 5	Forensic Genetics			
A	Mendelian Inheritance. Hardy Weinberg Equilibrium. Relevance of population genetics. Allele frequency, genotype frequency. Polymorphism and heterozygosity.			CO5
B	Mutation- their types and causes, Measures of genetic variations. Human genetic variations.			CO5
C	Human genetics- heredity, alleles, mutations and population genetics,			CO5
Mode of examination	Theory			
Weightage Distribution	CA	MTE	ETE	
	25%	25%	50%	
Text book/s*	James, S.H and Nordby, J.J. (2003) Forensic Science: An introduction to scientific and investigative techniques CRC Press, Saferstein: Criminalistics (1976) Prentice Hall Inc., USA.			

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	2	3	3	2	2	3	3	3
CO2	3	3	3	2	3	3	3	2	2
CO3	3	2	3	3	2	2	3	2	2
CO4	3	3	3	3	3	3	2	2	2
CO5	3	2	3	2	2	3	3	2	3
CO6	3	3	3	3	1	2	1	3	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 4th	
1	Course Code	FSM 244	
2	Course Title	Forensic DNA profiling and Bioinformatics	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with forensic DNA and bioinformatics as evidence and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations.	
6	Course Outcomes	CO1 :: To know basics of genetic material CO2 :: To understand and identify evidences in forensic DNA profiling I CO3 :: Examine various evidences in forensic DNA profiling II CO4 :: analyse evidences in forensic DNA profiling III CO5 :: To evaluate and inspect bioinformatics for criminal investigation CO6:: Analyze the methods for separation, extraction and analysis of DNA evidence.	
7	Course Description	The course “Forensic DNA profiling and Bioinformatics” aims at developing basic understanding about forensic DNA and bioinformatics, its effect on criminal justice system and newer advances in forensic physics. This course encompasses relationship of forensic DNA and bioinformatics as evidence and its analysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to forensic DNA and bioinformatics. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the DNA and bioinformatics as evidence.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Genetic Material	CO1
	A	Structure and function of DNA, RNA and genome organization. Denaturation and Renaturation of DNA. Double helical structure of DNA, alternate forms of DNA double helix.	CO1
	B	Nature and structure of human genome and its diversity. mt-DNA, Y-Chromosomes.	CO1
	C	DNA binding proteins, factors affecting DNA stability, types and structure of RNA. Chemical nature of DNA and RNA	CO1
	Unit 2	Forensic DNA profiling I	CO2



A	Introduction- History, Genetic basis of Forensic DNA typing, Technological basis of Forensic DNA typing, Collection and Preservation of physical evidence for DNA typing.	CO2
B	Sample collection and preservation. DNA Extraction Methods. Quantification and Quality assessment methods. PCR amplification – PCR process, components, controls, advantages and disadvantages, types of PCR.	CO2, CO6
C	Analysis of PCR product- Sequence polymorphism (HLA DQA1, Polymarker Amplitype PM6, Mitochondrial DNA) Length polymorphism (STRs, Gender identification,)	CO2, CO6
Unit 3	Forensic DNA profiling II	CO3
A	DNA separation methods: Slab gel and Capillary Electrophoresis. DNA detection methods: Fluorescent Dyes and Silver-staining	CO3, CO6
B	Forensic DNA typing system – RFLP, Amp-RFLP. STR. Mini STR. Y-STR. X-STR. Single Nucleotide Polymorphism.	CO3, CO6
C	Microbial DNA testing, Non-Human DNA testing, Plant DNA testing. Gender identification, CODIS	CO3
Unit 4	Forensic DNA profiling III	CO4
A	Interpretation of the DNA typing results, Statistical evaluation of DNA typing results and preparation of reports	CO4
B	Emerging molecular techniques in Forensic DNA Typing (DNA cloning, DNA chips, Touch DNA)	CO4
C	Applications of DNA profiling- Legal standards for admissibility of DNA profiling. Applications in disputed paternity cases, child swapping, missing person's identity- civil immigration, veterinary, wildlife and agriculture cases, limitations of DNA profiling.	CO4
Unit 5	Bioinformatics	CO5
A	Introduction to bioinformatics and its application in forensics. Integrated information retrieval. Major databases	CO5



		in bioinformatics. Sequence alignment, Phylogenetic analysis and related tools			
B		Gene identification and prediction. FASTA and BLAST algorithm. Bioinformatics analysis of DNA Microarray, Basic theory of probability and statistics. Bayesian analysis. Likelihood ratio. Statistical evaluation of DNA profiles using Bioinformatics tools.			CO5
C		Bioinformatics tools of forensic applications- Clustal family, BioEdit, MEGA, Arlequin, Protein structure prediction and visualization tools. Tools used in proteomics, In-silico simulation for molecular biology experiments.			CO5
Mode of examination		Theory			
Weightage Distribution	CA	MTE	ETE		
	25%	25%	50%		
Text book/s*	James, S.H and Nordby, J.J. (2003) Forensic Science: An introduction to scientific and investigative techniques CRC Press, Saferstein: Criminalistics (1976) Prentice Hall Inc., USA.				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	2	3	3	2	2	3	2	3
CO2	3	3	3	2	3	3	3	2	2
CO3	3	2	3	3	2	2	3	3	2
CO4	3	3	3	3	3	3	2	2	3
CO5	3	2	3	2	2	3	3	2	2
CO6	2	3	2	2	2	1	2	2	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester:4	
1	Course Code	FSM 262	
2	Course Title	Advance Forensic Serology and DNA Profiling-Lab	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course objective	1. To let the student understand various practical aspects of forensic serological and DNA evidences its isolation, separation, identification, comparison 2. To examine and analyse the evidence for serving the criminal justice system	
6	Course outcome	CO1 :: To know DNA and its isolation, separation, identification and PCR analysis CO2 :: Understand bloodgrouping methods CO3 :: Examine blood and its species of origin CO4 :: analyse methods for examination of semen and saliva CO5 :: Evaluate and inspect methods for examination of urine and sweat CO6:: Examination of blood spatter analysis.	
7	Course description	After completion of the course student will be able to know about the investigation and examination of evidences like DNA, blood, and body fluids classified under forensic serology and DNA profiling evidences to solve various crime related investigations on-site or in forensic laboratory	
8	Outline syllabus		CO Mapping
	Unit 1	Isolation, separation, identification and PCR analysis of DNA	CO1
		Isolation of DNA from the plant tissues	CO1
		Isolation of DNA from the blood	CO1
		Quantification of DNA and Thermocycling	
		DNA Gel electrophoresis	CO1
	Unit 2	Examination of Blood spatter and Blood Grouping methods	CO2,CO6
		Determination height of impact of force by the blood spatter	CO2
		Identify the types of weapon from the pattern	CO2
		Perform the blood grouping	CO2
	Unit 3	Examination of Blood and its species of origin.	CO3
		Chemical test for blood	CO3
		Microcrystal test for blood	CO3



		Perform the precipitation test to identify the origin of species			CO3
Unit 4	Examination of Body fluids – Semen and Saliva				CO4
	Chemical test for Saliva				CO4
	Chemical test for semen				CO4
	Confirmatory test for semen				CO4
Unit 5	Examination of Body fluids – Urine and Sweat				CO5
	Chemical test for urine				CO5
	Chemical test for saliva				CO5
	Confirmatory test for urine and saliva				CO5
Mode of examination	Practical/Viva				CO5
Weightage Distribution	CA	CE	ETE		
	25%	25%	50%		

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	2	3	3	2	2	3	3	3
CO2	3	2	3	2	3	3	3	3	3
CO3	3	2	3	3	2	2	3	2	2
CO4	3	3	3	3	3	3	2	3	2
CO5	3	2	2	2	2	3	3	2	3
CO6	3	3	3	3	2	1	1	3	3



Specialization: Forensic Physical Sciences

School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 4th	
1	Course Code	FSM 245	
2	Course Title	Advances in Forensic Ballistics	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with forensic ballistics and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations.	
6	Course Outcomes	CO1 :: To know about internal ballistics and factors related to it CO2 :: To understand and discuss external ballistics and phenomenon related to it CO3 :: Illustrate terminal ballistics and effect of projectile on hitting the Target. CO4 :: Analyze the concept of wound ballistics and injuries caused by firearms CO5 :: Evaluate and detecting GSR evidence found in crime scene CO6:: Analyze the parameters of internal and external ballistics.	
7	Course Description	The course “Advances in Forensic ballistics” aims at developing basic understanding about forensic ballistics, its effect on criminal justice system and newer advances in forensic ballistics. This course encompasses relationship of forensic ballistics and its analysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to forensic ballistics. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the ballistic evidences	
8	Outline syllabus		CO Mapping
	Unit 1	Internal Ballistics	CO1



A	Definition, Ignition of the propellant, Shapes of Propellants, Manner of the propellant burning, Piobert's law, Pressure space curve, Shot Start Pressure,	CO1
B	All Burnt Point, Velocity, Le Du's formula, Muzzle velocity, various factors affecting the internal ballistics: lock time, barrel time, erosion, corrosion and gas cutting, equation of motion of projectile,	CO1,CO6
C	Density of loading, Heat problems, Vibration & jump, Measurement of strength of firearm, projectile velocity determination, theory of recoil, methods for measurement of recoil.	CO1,CO6
Unit 2	External Ballistics	CO2,CO6
A	Bullet Drop in the flight, Use of sight to compensate for bullet drop, Influence of Earth on Trajectory,	CO2,CO6
B	Angle of Fall, Ballistic Coefficient and Air resistance-base drag, Sectional Density, Brief introduction to Terminal velocity, Maximum effective range,	CO2,CO6
C	Drift, Yaw, Precession, Nutation, Terminal velocity, Ballistics tables, measurements of trajectory parameters, Escape velocity & Ricochet.	CO2,CO6
Unit 3	Terminal Ballistics	CO3
A	Definition, Effect of projectile on hitting the target: function of Bullet shape, striking velocity, striking angle and nature of target,	CO3
B	tumbling of bullets, effect of instability of bullet, effect of intermediate targets, function of bullet shape, striking velocity, striking angle and nature of target, tumbling of bullets,	CO3



	C	Brief introduction to Cavitations (Temporary and Permanent), Ricochet and its effects, stopping power			CO3
	Unit 4	Wound Ballistics			CO4
	A	Ballistic aspect of firearm injuries, Mechanism of firearm injuries (Lacerations and Shockwaves etc.), Threshold velocity for penetration of skin/flesh/bones			CO4
	B	preparation of gel block, penetrative in gel block and other targets, Bullet Entry/Exit Hole Identification, Evaluation of Accident, Suicide, murder and self defense firearm injuries, explosive wounds			CO4
	C	Evaluation of injuries caused due to shot-gun, rifle, handguns and country made firearms, methods of measurements of wound ballistics parameters, post-mortem and anti-mortem firearm injuries			CO4
	Unit 5	GSR and test firing			CO5
	A	Composition of GSR depending upon propellants & primer mixtures, GSR Distribution, Procedure for test fire, Purpose for test firing, Recovery methodology			CO5
	B	Mechanism of formation of GSR, Location, source and collection of GSR, Analysis of GSR: spot test, chemical test, Specifications of Firing gallery, working of automatic firing rest,			CO5
	C	Identification of shooter and instrumental techniques involved of GSR Analysis, Practical problems related with GSR detections, Safety & Preventive measures. Characterization of bullet proof jacket, Arms act – Report writing and court testimony			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	



	Text book/s*	Jauhri, M. 1980 : Monograph on Forensic Ballistics, Govt. Of India Publication, New Delhi. Burrad, 1951 : The Identification of Firearms and Forensic Ballistics..	
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Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	2	2	2	3	3
CO 2	3	2	3	2	2	2	3	3	3
CO 3	3	2	3	3	2	2	2	2	2
CO 4	3	3	3	3	3	3	2	2	3
CO 5	3	2	2	3	2	3	3	3	3
CO 6	3	2	2	2	1	1	1	3	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 4th	
1	Course Code	FSM 246	
2	Course Title	Mobile and Wireless Device Forensics	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To provide students understandings about the basic concepts, approaches and methods to deal with mobile and wireless device forensics and its analysis thereby enabling them to appreciate and critique the nuances of Criminal case as well the ethical dimensions of conducting investigations.	
6	Course Outcomes	CO1 :: Define and describe basics of mobile and wireless technology CO2 :: To understand and identify wireless device securities CO3 :: Apply various methods for evidences related to mobile forensics CO4 :: analyse evidences in android and iOS devices CO5 :: Evaluate and inspect and solve cases using biometric system as an evidence CO6:: Create information about recent advancement in mobile forensics.	
7	Course Description	The course “Mobile and Wireless Device Forensics” aims at developing basic understanding about mobile and wireless device, its effect on criminal justice system and newer advances in mobile and wireless device. This course encompasses relationship of evidences of mobile and wireless device and its analysis with crime investigation related to it. Moreover, the course is focused on the advances in the most emerging area of forensic science related to mobile and wireless device forensics. The knowledge of this course will give the student to investigate and conclude cases of crime using various instrumental analysis, classification, comparison and identification of the mobile and wireless device evidences	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction to Mobile and Wireless Technologies	
	A	Asynchronous Transfer Mode (ATM), Wireless Application Protocol (WAP). Cellular technologies including Advanced Mobile Phone System (AMPS), Imode, Time Division Multiple Access (TDMA)	CO1



B	Code Division Multiple Access (CDMA) and Global System for Mobile Communications (GSM) including features and relative strengths.	CO1
C	Functions of Subscriber Identity Module (SIM), International Mobile Equipment Identity (IMEI), Bluetooth and Mobile Payment Gateways. Understanding of the mobile phone operating systems – Android, iOS, Windows	CO1
Unit 2	Mobile and Wireless Devices Security	
A	Security issues in Bluetooth, Mobile phones including SIM cloning and other Bluetooth vulnerabilities.	CO2,CO6
B	Attacks – Denial of Service (DOS), Packet Spoofing & Masquerading, Eavesdropping, VOIP Spam and Vishing (VOIP Phishing), Toll frauds, Phone Phreaking, Call tampering, Wireless Hack Walkthrough and Man-in-the-Middle-attacks. Overview of WEP attack. Attacks on WEP, WPA and WPA-2 Encryption, fake hotspots	CO2
C	Wireless Public Key Infrastructure. Securing WLAN, WEP Decryption script, Understanding of SQLite Databases. Voice, SMS and Identification Data Interception in GSM. SMS security issues – Availability, Confidentiality and Integrity issues.	CO2
Unit 3	Overview of Mobile Forensics	
A	Mobile Forensic, Types of Evidence present in mobile phones – Files present in SIM card, external memory dump, and evidences in memory card.	CO3,CO6
B	Seizure and Preservation of mobile phones and PDA. Mobile phone evidence extraction process, Data Acquisition	CO3,CO6



		Methods – Physical, File System, Logical and Manual Acquisition.			
C		Good Forensic Practices, Mobile Forensic Investigation Toolkit. Tracking of mobile phone location. Challenges to Mobile forensics.			CO3,CO6
	Unit 4	Android and Ios Device Forensics			
A		Android Forensics – Procedures for handling android device, imaging android USB mass storage devices, Logical and physical data extraction techniques.			CO4
B		Ios Forensics – File Systems, Ios architecture, Data stored in iPhones, Crosscontamination and Syncing,			CO4
C		Data recovery techniques. Forensic tools used. CDR and IPDR analysis. Data extraction – Extracting Image Geo-Tags, Data Analysis and Recovery – SQLite databases, Forensic Tools used.			CO4
	Unit 5	Biometrics			
A		Ear Biometrics: location and identification of ears in real time; uniqueness, permanence, universality and collectability, detection and recognition in existing 2D/3D images of ear; Criminal identification			CO5
B		Iris recognition: introduction, anatomical and physiological underpinning, iris signature representation and matching; localisation, representation, matching			CO5
C		Retina Recognition: structure of eye, human retina and structure, unique pattern of blood vessels, retina pattern and identification			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	



Text book/s*	<ol style="list-style-type: none">1. Wold, G.H: Computer Crime, T echniques of Prevention Goyal, R.M. and Pawar, M.S. : Computer crimes.2. Nina Godbole and Sunit Belapore; “Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives”, Wiley Publications, 2011.	
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Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	2	2	2	2	3
CO 2	3	2	3	2	2	2	3	3	3
CO 3	3	2	3	3	2	2	2	3	3
CO 4	3	3	3	3	3	3	2	2	2
CO 5	3	2	2	3	2	3	3	3	3
CO 6	3	3	3	3	2	3	2	3	3



School: SSAHS		Batch: 2023-25	
Programme		Master of Science (Forensic Science)	
Branch: FSM		Semester: 4	
1	Course Code	FSM 263	
2	Course Title	Lab- Advance Wireless devices and Ballistics	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Type	Compulsory	
5	Course Objective	To gain knowledge related to wireless device forensics, data acquisition procedures. The course also focusses on ballistics examination of evidences.	
6	Course Outcomes	CO 1: Define the examination of class and individual characteristics of ammunition CO 2: Understand the matching of bullet and cartridges CO 3: To Apply methods for Examination of GSR CO 4: Analysis of mobile and wireless device security CO 5: Evaluate the data extraction procedures CO 6: develop a correlation between bullet, cartridge and firearm.	
7	Course Description	The course aims to provide knowledge on mobile and wireless device forensics and the techniques to retrieve data and it also encompasses the examination of firearm evidences.	
8	Outline syllabus		CO Mapping
	Unit 1	Examination of Bullet and Cartridge case	CO1
		Class and Individual Characteristics of Bullet	
		Class and Individual Characteristics of Cartridge case	
	Unit 2	Matching of Bullets and Cartridge Cases	CO2,CO6
		Comparison of test and suspected bullet	
		Comparison of test and suspected cartridge	
		Examination of firing pin impression	
		Report Writing & Court Room Testimony.	
	Unit 3	Examination of GSR	CO3
		Collection of GSR from scene of crime	



		Examination of organic components of GSR by chemical test			
		Examination of inorganic components of GSR by chemical test			
		Microscopic examination of GSR			
Unit 4		Common Vulnerability Analysis and Penetration Testing for Mobiles and Wireless Devices Security			CO4
		Network and wireless vulnerability assessment Database vulnerability assessment Cloud-based vulnerability assessment Android Phone Pen Testing iPhone Pen Testing Windows Phone Pen Testing			
Unit 5		Data Extraction from Android and Ios Devices			CO5
		To identify, seize and preserve digital evidence from crime scenes Data Extraction from Android devices Data Extraction from Ios Devices Data Extraction from USB storage devices Report Writing & Court Room Testimony.			
Mode of examination		Theory			
Weightage Distribution	CA	CE	ETE		
	25%	25%	50%		
Text book/s*	<ol style="list-style-type: none"> Wold, G.H: Computer Crime, Techniques of Prevention Goyal, R.M. and Pawar, M.S. : Computercrimes. Nina Godbole and Sunit Belapore; "Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley Publications, 2011. 				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO 1	3	2	3	3	2	2	2	3	2
CO 2	3	2	3	2	2	2	3	2	3
CO 3	3	2	3	3	2	2	2	3	3
CO 4	3	3	3	3	3	3	2	3	3
CO 5	3	2	2	3	2	3	3	3	2
CO6	3	3	3	3	2	3	1	3	3



School: SSAHS		Batch: 2023-25
Programme		Master of Science (Forensic Science)
Branch: FSM		Semester: 4
1	Course Code	FSM247
2	Course Title	Dissertation
3	Credits	16
4	Contact Hours (L-T-P)	0-0-16
	Course Type	Compulsory