



SWAMI VIVEKANAND
SUBHARTI
UNIVERSITY
UGC Approved Meerut



Ordinance No. :- V-126-B-46

(Approved in Academic council meeting held on 11.03.2026
Proposed to be ratified in forthcoming executive council)

**Evaluation Scheme and Syllabus
of**

B.Sc. Forensic Science

**FOUR – YEAR UNDER GRADUATE
PROGRAM**

(AS PER NEP-2020)

Keral Verma Subharti College of Science

Swami Vivekanand

SUBHARTI UNIVERSITY

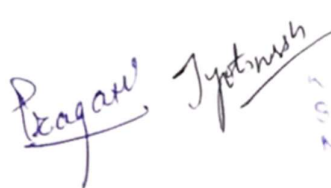
Meerut

(Effective from session 2025-26)

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PROGRAM OBJECTIVES

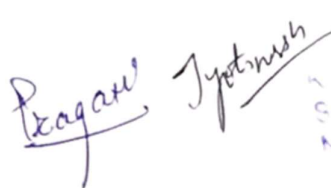
1. Forensic science is a critical element of the criminal justice system.
2. Forensic Scientists analyze physical evidence (fingerprints, blood, hair etc.) collected from the incident scene to identify suspects.
3. Forensic professionals use image modification tools to search for criminals absconding from the law for a long time.
4. The uniform grading system will benefit the students to move across institutions within India to begin with and across countries.
5. It will also enable potential employers in assessing the performance of the candidates across the world.



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PROGRAM OUTCOME

1. **PSO1:** To demonstrate an understanding of the importance and application of scientific methods in crime detection.
2. **PSO2:** To analyze recent advancements in forensic science and disseminate knowledge for academic and professional development.
3. **PSO3:** To evaluate the role of forensic science in ensuring justice, ethical practices, and the well-being of society.
4. **PSO4:** To apply systematic approaches and quality standards for achieving excellence in forensic science practices.
5. **PSO5:** To develop competent human resources equipped with skills that meet the contemporary requirements of forensic science.
6. **PSO6:** To foster collaboration and innovation by providing a platform for students and professionals to exchange knowledge, design programs, and promote holistic growth of forensic science.



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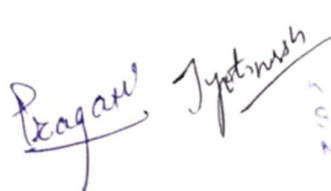
CREDIT DISTRIBUTION TABLE

SWAMI VIVEKANAD SUBHARTI UNIVERSITY MEERUT
KERAL VERMA SUBHARTI COLLEGE OF SCIENCE

Department of Forensic Science

B.Sc Forensic Science
(Session 2025-26 onwards)

		I	II	III	IV	V	VI	VII	VIII	Total
1	Major	11	11	9	15	10	14	16	4	90
2	Minor	3	3	3	3	6	6	4	4	32
3	Multi Disciplinary	3	3	3						9
4	Ability Enhancement Course	2	2	2	2					8
5	Skill Enhancement Course	3	3	3						9
6	Value Added Course	2	2							4
7	Internship					4				4
8	Research								12	12
	Total	24	24	20	20	20	20	20	20	168

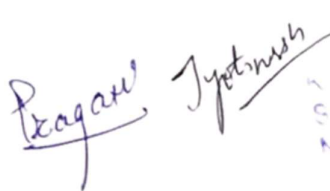


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**EVALUATION SCHEME
I YEAR**

SWAMI VIVEKANAD SUBHARTI UNIVERSITY MEERUT														
KERAL VERMA SUBHARTI COLLEGE OF SCIENCE														
Department of Forensic Science														
Course Name - B.Sc. Forensic Science														
Batch:2025 -26			SEM:I											
S.No.	Course Type	Course Code	Course Name	Teaching Load			Credits	Attendance (5)	Internal Assessment			External Assessment	Total	Remark
				L	T	P			quiz/PP T/Assignment (10)	Mid Sem Test (15)	End Sem Exam (70)			
THEORY and PRACTICAL SUBJECTS														
1	Major 1	BSFS-101	Introduction to Forensic Science	4	0	0	4	5	10	15	70	100		
2	Major 2	BSFS-102	Criminology and Criminal Law	4	0	0	4	5	10	15	70	100		
3	Minor 1	BSFS-103A	General Physics-I	3	0	0	3	5	10	15	70	100		
		BSFS-103B	General Chemistry-I											
		BSFS-103C	General Biology-I											
4	Multi Disciplinary	M-DIS-CS	Crime and Society	3	0	0	3	5	10	15	70	100		
		M-DIS-JD	Juvenile Delinquency											
5	Ability Enhancement Course	AEC-01	English Communication Skill	2	0	0	2	5	10	15	70	100		
6	Skill Enhancement Course (SEC)	SEC-CSM	Crime Scene Management	1	0	4	3	5	10	15	70	100		
		SEC-CFE	Collection of Evidences											
7	Value Added Course	VAC-FI	Fraud Investigation	2	0	0	2	5	10	15	70	100		
8	Practical 1	BSFS-104P	Based on Major1+2+ Minor 1	0	0	6	3	5	10	15	70	100		
9	IKS / Rastrabodh	VAC-RB		2	0	0	2	5	5	10	30	50	Qualifying	
TOTAL CREDITS / ASSESSMENT							24	40	80	120	560	800		



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KERAL VERMA SUBHARTI COLLEGE OF SCIENCE													
Department of Forensic Science													
Course Name - B.Sc. Forensic Science													
Batch:2025 -26			SEM:II										
S. No.	Course Type	Course Code	Course	Teaching Load			Credits	Attendance (5)	Internal Assessment		External Assessment	Total	Remark
				L	T	P			quiz/PP T/Assignment (10)	Mid Sem Test (15)			
THEORY and PRACTICAL SUBJECTS								Attendance (5)	quiz/PP T/Assignment (10)	Mid Sem Test (15)	End Sem Exam (70)	Total	Remark
1	Major 3	BSFS-201	Questioned Documents	4	0	0	4	5	10	15	70	100	
2	Major 4	BSFS-202	Forensic Dermatoglyphics	4	0	0	4	5	10	15	70	100	
3	Minor 2	BSFS-203A	General Physics-II	3	0	0	3	5	10	15	70	100	
		BSFS-203B	General Chemistry-II										
		BSFS-203C	General Biology-II										
4	Multi Disciplinary 2	M-DIS-DVI	Disaster Victim Identification	3	0	0	3	5	10	15	70	100	
		M-DIS-DD	Detection of Deception										
5	Ability Enhancement Course 2	AEC-02	Environmental Science	2	0	0	2	5	10	15	70	100	
6	Skill Enhancement Course 2	SEC-FS	Fingerprint Science	1	0	4	3	5	10	15	70	100	
		SEC-BHC	Basics of Handwriting Comparison										
7	Value Added Course 2	VAC-FA	Forensic Accounting	2	0	0	2	5	10	15	70	100	
8	Practical 2	BSFS-204P	Based on Major 3+4+ Minor 2	0	0	6	3	5	10	15	70	100	
9	IKS / Rastra bodh	VAC-IKS		2	0	0	2	5	5	10	30	50	Qualifying
TOTAL CREDITS / ASSESSMENT							24	40	80	120	560	800	

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B. Sc. Forensic Science
Semester I
Introduction to Forensic Science

Credits: 4

Hours: 60

Course Title: Introduction to Forensic Science	Course Code: BSFS-101
Course Type: Major Theory, L-T-P: 4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able:

1. To Learn the basic concepts of forensic science.
2. To study the history of forensic science.
3. To understand the organization of forensic laboratory.
4. To acquire knowledge on agencies involved in crime detection and investigation.
5. To develop skills in the collection, preservation, and analysis of physical evidence
6. To apply forensic knowledge in solving real-life crime cases with scientific methods.

Credits: 4

Hours: 60

Unit 1: Concepts in forensic science

15 hours

Introduction of Forensic Science. Branches and Principles of forensic science; Classification of evidence (according to BSA 2024); FryeRule; Daubert Standards; Terminologies in forensic science: First responder, chain of custody, Code of conduct for forensic scientists; Duties of forensic scientists; Report writing. Ethics in Forensic Science.

Unit 2: Organization of Forensic Science Laboratory

15 hours

Forensic Science Laboratories in India: history, development and hierarchical set up; Crime scene and its types. Crime Scene Management. Special Crime scene and crime scene reconstruction. The evaluation of 5Ws (who?, what?, when?, where?, why?) and 1H (how?). Agencies involved in crime detection and investigation.

Unit 3: Crime Scene Investigation & Photography

15 hours

Securing the crime scene; Evaluating the crime scene; Preliminary walk-through and documentation of the crime scene; Search methods; Photography of the crime scene; Role of Colored filters in Forensic Photography; Infrared photography; Transmitted light & Oblique light photography. Identifying and listing evidence along with their evidentiary value.

Unit 4: Collection and preservation of evidence

15 hours

Collection and preservation of evidence along with control samples and standards: General safety considerations while handling evidence in the crime scene; Forwarding evidence to the Forensic Science Laboratory.

Suggested Readings:

1. Brenner, J. C. (2004). *Forensic Science: An Illustrated Dictionary*. CRC Press. Eckert, W. G. (1997). *Introduction to Forensic Sciences (2nd Edition)*. CRC Press.
2. James, S. H., Nordby, J. J., Bell, S. (2014). *Forensic Science: An Introduction to Scientific and Investigative Techniques (4th Edition)*. CRC Press.
3. Nabar, B. (2017). *Forensic Science in Crime Investigation*. Asia Law House.
4. S Nath, R. C. (2013). *Forensic Science and Crime Investigation: Abhijeet Publications*. Saferstein, R. (2017). *Criminalistics: An Introduction to Forensic Science*. Pearson.

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5. Sharma, B. R. (2019). *Forensic Science in Criminal Investigation & Trails*. Universal Law Publishing Company.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S.No	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30

**B. Sc. Forensic Science
Semester I
Criminology & Criminal Law**

Credits: 4

Hours: 60

Course Title: Criminology and Criminal Law	Course Code: BSFS-102
Course Type: Major Theory, L-T-P: 4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able:

1. To explain the basic concepts of criminology, causes of crime, and classifications of criminals.
2. To describe correctional methods, victimology, and apply forensic approaches in rehabilitation.
3. To analyze the structure of the Indian criminal justice system and its legal processes.
4. To evaluate criminal laws and demonstrate the role of forensic evidence in legal contexts.
5. To illustrate investigation steps, trial procedures, and assess the roles of forensic experts.
6. To develop case-based solutions by integrating criminological theories, forensic methods, and legal frameworks.

Credits: 4

Hours: 60

Unit 1: Fundamentals of Criminology and Criminal Behaviour

15 hours

Definition, elements, and characteristics of crime; crime triangle; historical evolution and scope of criminology; major theories of criminology; causes of crime including socio-economic and psychological factors; classification and typology of crimes and criminals; concepts of juvenile delinquency, child labour, dowry, drug abuse, and domestic violence.

Unit 2: Penology, Victimology and Correctional Practices

15 hours

Historical development of penology and correctional administration; theories and types of punishment; Indian prison system and classification of prisoners; non-institutional correctional measures: probation, parole, and after-care. Introduction to victimology and criminal profiling; victimization process and types: primary, secondary, tertiary; victim psychology and victimless crimes; role of forensic psychology in victim profiling.

Unit 3: Criminal Justice System and Legal Processes in India

15 hours

Structure and functions of the criminal justice system; adversarial and inquisitorial systems; legislative and judicial processes; coordination and reforms in the justice system with reference to the Malimath Committee

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report; hierarchy of courts and alternative dispute resolution systems; concept of due process, speedy trials, and access to justice.

Unit 4: Substantive and Procedural Laws in Forensic Context

15 hours

Salient features of IPC and BNS; Overview of BNSS/CrPC procedures including arrest, search and seizure, FIR, bail, charge framing, trial process, and judgment. Overview of IEA and BSA. Introduction to POCSO Act, The Domestic Violence Act, and The Juvenile Justice Act. Stages of a Criminal Investigation; Role of Forensic Experts in Investigations; Case Diary and Charge Sheet; Courtroom Procedures in Criminal Trials; Witness Protection and Hostile Witnesses; Landmark Case Studies.

Suggested Readings:

1. Carrabine, E., Cox, P., Lee, M., Plummer, K., & South, N. (2020). *Criminology: A Sociological Introduction (4th Edition)*. Routledge.
2. Doerner, W. G., & Lab, S. P. (2020). *Victimology (9th Edition)*. Routledge.
3. Pillai, K. N. C. (2023). *Criminal Law (15th Edition)*. LexisNexis.
4. Ratanlal, &Dhirajlal (2023). *The Indian Penal Code (38th Edition)*. LexisNexis.
5. Kumar, A. (2021). *Criminal Procedure Code (Latest Edition)*. Central Law Agency.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

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1.	Attendance		05
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		Mid semester test	15
Total			30

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B. Sc. Forensic Science
Multi-disciplinary Course
Crime and Society

Credits: 3

Hours: 45

Course Title: Crime and Society	Course Code: M-DIS-CS
Course Type: Multi-disciplinary Course, L-T-P: 3-0-0	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcome: After successful completion of the course, the student will be able:

1. To describe the types, causes, and consequences of crime and deviant behavior.
2. To explain the relationship between social change, psychological factors, and criminality.
3. To analyze the role of social institutions in influencing crime and deviance.
4. To evaluate the impact of media, technology, and globalization on crime and society.
5. To apply criminal justice knowledge to real-world scenarios.
6. To develop strategies for crime prevention and community safety.

Credits: 3 Hours: 45

Unit 1 Nature of Crime

12 Hours

Elements, nature, causes and consequences of crime. Concept of deviant behavior and its distinction from crime. Hate crimes, organized crimes and issues of public disorder. Domestic violence and workplace violence as forms of social crime. White collar crimes and their influence on social and economic systems.

Unit 2: Crime, Society and Victims

11 Hours

Introduction to victimology and the role and rights of victims in the justice system. Juvenile delinquency, its causes, legal provisions and methods of rehabilitation. Relationship between social change and patterns of crime. Psychological disorders and their link to criminal behavior. Situational crime prevention and its role in reducing opportunities for crime.

Unit 3: Crime and Social Institutions

11 Hours

Role of family in shaping criminal or anti-criminal tendencies. Influence of education and lack of education in relation to crime. Religion and its association with crime and social control. Economic and political dimensions of crime in society. Impact of peer groups, community life and urbanization on criminality. Poverty, inequality and unemployment as contributing factors to crime. Media, technology and globalization as modern influences on crime and deviance.

Unit 4: Criminal Justice System and Society

11 Hours

Overview of the broad components of the criminal justice system. Policing styles and principles in the context of crime control. Powers of the police in investigation and evidence collection. Process of filing criminal charges and role of prosecution. Community policing as a strategy for crime prevention. Challenges of policing in a heterogeneous and diverse society. Correctional measures and rehabilitation programs for offenders. Human rights concerns within the criminal justice system in India.

Suggested Readings:

1. S.H. James and J.J. Nordby, *Forensic Science: An Introduction to Scientific and Investigative Techniques*, 2nd Edition, CRC Press, Boca Raton (2005).


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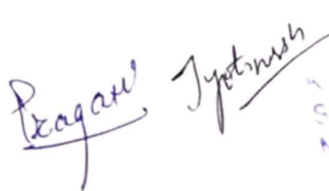
2. D.E. Zulawski and D.E. Wicklander, *Practical Aspects of Interview and Interrogation*, CRC Press, Boca Raton (2002).
3. R. Saferstein, *Criminalistics, 8th Edition*, Prentice Hall, New Jersey (2004).
4. J.L. Jackson and E. Barkley, *Offender Profiling: Theory, Research and Practice*, Wiley, Chichester (1997).
5. /R. Gupta, *Sexual Harassment at Workplace*, LexisNexis, Gurgaon (2014).

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

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Total			30



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**B. Sc. Forensic Science
Multi-disciplinary Course
Juvenile Delinquency**

Credits: 3

Hours: 45

Course Title: Juvenile Delinquency	Course Code: M-DIS-JD
Course Type: Skill Enhancement Course, L-T-P: 3-0-0	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcome: After successful completion of the course, the student will be able:

1. To understand the concept, evolution, and classification of juvenile delinquency.
2. To analyze individual, family, peer, and socio-cultural factors influencing delinquency.
3. To evaluate prevention, intervention, and rehabilitation strategies for juveniles.
4. To explain the structure and functioning of the Juvenile Justice System in India.
5. To assess the role of police and stakeholders in managing juvenile offenders.
6. To apply knowledge to design effective juvenile crime prevention and rehabilitation measures.

Credits: 3 Hours: 45

Unit 1 Introduction to Juvenile Delinquency

12 Hours

Definition and Concept of Juvenile Delinquency. Historical evolution of juvenile justice. Difference between juvenile delinquency and adult crime. Classification of juvenile delinquents (accidental, habitual, situational, etc.). Global and Indian trends in juvenile crimes.

Unit 2: Causes and Risk Factors

11 Hours

Individual factors: temperament, personality traits, mental illness. Family factors: broken families, parental neglect, abuse. Peer influence and gang involvement. School factors: truancy, academic failure. Media and technology influences. Substance abuse. Socioeconomic and cultural factor

Unit 3: Prevention, Intervention, and Rehabilitation

11 Hours

Early intervention programs: family-based, school-based. Government and NGO roles in rehabilitation. Juvenile reformatories and observation homes. Counseling and psychiatric support. Community-based corrections and restorative justice approaches.

Unit 4: Juvenile Justice System in India

11 Hours

The Juvenile Justice (Care and Protection of Children) Act, 2015. Structure and functioning of: Juvenile Justice Boards (JJBs), Child Welfare Committees (CWCs), Observation Homes, Special Homes, and Place of Safety. Role of police in handling juveniles (Special Juvenile Police Unit - SJPU).

Suggested Readings:

1. *Juvenile Delinquency: Causes and Control* by Robert Agnew
2. *Juvenile Delinquency: Theory, Practice, and Law* by Larry J. Siegel
3. Clayton A. Hartjen. (2008). *Youth, Crime and Justice: A Global Inquiry*. Rutgers University Press. (Chapter 1 & 4.
4. Bynum, Jack E. & William E. Thomson. (2007). *Juvenile Delinquency: a sociological approach (7thed.)*. Pearson Education Inc: USA. (Chapter 1, p. 3- 24)

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

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Total			30

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**B. Sc. Forensic Science
Skill Enhancement Course
Collection of Forensic Evidences**

Credits: 3

Hours: 45

Course Title: Collection of Forensic Evidences	Course Code: SEC-CFE
Course Type: Skill Enhancement Course, L-T-P: 1-0-4	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): *At the end of the course, the student should be able to:*

1. Understand principles and protocols for collection and preservation of forensic evidence.
2. Apply correct methods for handling biological, trace, chemical, and toxicological samples.
3. Demonstrate techniques for packaging and safeguarding fragile, digital, and environmental evidence.
4. Document evidence with proper labeling, photography, and chain of custody.
5. Evaluate quality assurance practices and legal implications in evidence management.
6. Analyze and interpret collected evidence to support investigative and judicial processes.

Credits: 3

Hours: 45

Unit 1: Biological and Trace Evidence

12 hours

Collection and preservation of blood, semen, saliva, urine, sweat, hair, and nails, Handling of DNA evidence (bloodstains, buccal swabs, tissues), Collection and packaging of trace evidence: fibers, glass, paint, soil, pollen, diatoms, Prevention of contamination and degradation in biological evidence.

Unit 2: Physical, Chemical, and Toxicological Evidence

11 hours

Collection and preservation of firearms, bullets, cartridge cases, tool marks, and impressions (shoe, tire, fingerprints), Handling of arson and explosive evidence: fire debris, accelerants, blast residues, Collection of toxicological samples: stomach contents, vomit, urine, blood, organs, Collection of questioned documents and ink samples.

Unit 3: Digital, Environmental, and Special Evidence

11 hours

Collection and preservation of digital evidence: computers, mobiles, storage devices, SIM cards, Environmental and wildlife evidence: soil, water, flora, fauna, ivory, bones, feathers, Packaging of fragile evidence (glass, charred materials, trace residues), Use of tamper-proof packaging and labelling systems, Case studies on handling unique and fragile evidence.

Unit 4: Documentation, Chain of Custody, and Quality Assurance

11 hours

Evidence documentation: notes, sketches, photography, videography, Preparation of evidence labels, seals, and forms, Maintaining chain of custody in forensic evidence management, Role of quality assurance and quality control in evidence handling, Case studies of evidence mismanagement and its legal consequences.

Suggested Readings:

1. *Saferstein, R. – Criminalistics: An Introduction to Forensic Science. Pearson, 2018.*
2. *James, S. H., Nordby, J. J., & Bell, S. – Forensic Science: An Introduction to Scientific and Investigative Techniques. CRC Press, 2014.*
3. *Gardner, R. M. – Practical Crime Scene Processing and Investigation. CRC Press, 2012.*
4. *Lee, H. C., Palmbach, T., & Miller, M. T. – Henry Lee's Crime Scene Handbook. Academic Press, 2001.*

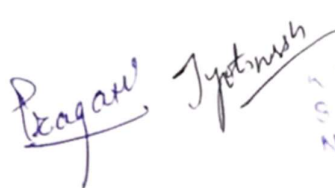

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5. Horswell, J. (Ed.). – *The Practice of Crime Scene Investigation*. CRC Press, 2016.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

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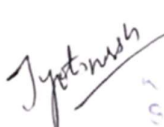
4. Hopwood, W. S., Leiner, J. J., & Young, G. R. *Forensic Accounting and Fraud Examination*. McGraw-Hill. Focus on accounting fraud, case studies, and prevention.
5. Albrecht, W. Steve et al. *Fraud Examination*. Cengage Learning. Student-friendly introduction with real-world cases.
6. Gottschalk, Petter. *Policing Fraud: Knowledge Management, Investigations, and the Disruption of White-Collar Crime*. CRC Press.

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Total			30



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**B. Sc. Forensic Science
Semester I
Practical-I**

Credits: 3 Hours: 90

Course Title: Practical-I	Course Code: BSFS-104P
Course Type: Practical, L-T-P: 0-0-6	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): *At the end of the course, the student should be able:*

1. *To set up, secure, and evaluate a mock crime scene with proper documentation.*
2. *To perform fundamental laboratory techniques in science and forensic analysis.*
3. *To simulate key legal and criminological procedures in a mock scenario.*
4. *To perform fundamental laboratory techniques in science and forensic analysis.*
5. *To apply basic principles of physics, chemistry, and biology in laboratory experiments.*
6. *To interpret and report forensic findings accurately for use in investigations and legal proceedings.*

Credits 3

Hours: 90

Introduction to Forensic Science Lab

1. To set up and investigate a mock/simulated crime scene.
2. To secure the mock crime scene and conduct its evaluation.
3. To identify the evidence from the mock crime scene and associate it with the appropriate branches of
4. forensic science for analysis.
5. To prepare the crime scene documentation of the mock crime scene (Notes making, photography,
6. videography, and sketching).
7. To write a forensic report on a crime case based on the mock crime scene.

Criminology and Criminal Law Lab

1. To analyze real-life case studies to understand the application of criminological theories (e.g., strain theory, social learning theory).
2. To simulate the steps of FIR filing, arrest, bail, and charge sheet preparation using a mock crime scenario.
3. To create a criminal profile based on behavioral indicators using mock data or case files.
4. To conduct a mock trial highlighting the stages of criminal proceedings, examination of witnesses, and expert testimony.
5. To review and interpret key sections from IPC/BNS and CrPC relevant to offences against the human body or property.

General Physics-I Lab

1. Verification of Hooke's Law using a spring.
2. Determination of acceleration due to gravity using a simple pendulum.
3. Determination of coefficient of viscosity of a liquid by Stokes' method.
4. Determination of specific heat capacity of a solid by calorimetry.
5. Determination of speed of sound in air using a resonance tube.

General Chemistry-I Lab

1. Preparation of standard sodium carbonate solution.
2. Determination of strength of a given hydrochloric acid solution using sodium hydroxide (acid-base titration).
3. Verification of Boyle's law using a simple apparatus.
4. Study of physical properties of liquids: surface tension and viscosity.
5. Identification of functional groups in simple organic compounds.

General Biology-I Lab

1. Study of prokaryotic and eukaryotic cells using microscope (bacteria, onion peel, cheek cells).

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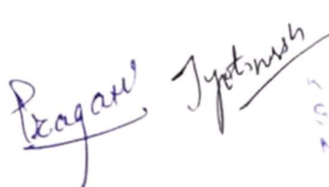
2. Identification of carbohydrates, proteins, and lipids in biological samples.
3. Observation and identification of fungi, algae, and protozoa from prepared slides/specimens.
4. Preparation of temporary slides of plant tissues (root, stem, and leaf).
5. Study of anatomical adaptations in xerophytes and hydrophytes through slides.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S.No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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**B. Sc. Forensic Science
Semester II
Questioned Documents**

Credits: 4

Hours: 60

Course Title: Questioned Documents	Course Code: BSFS-201
Course Type: Major Theory, L-T-P: 4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes: At the end of the course, the student should be able:

1. To learn basics of questioned document examination and its tools.
2. To explain principles of handwriting individuality and sample limitations.
3. To apply techniques to detect tampering, recover writings, and authenticate materials.
4. To analyze security features in counterfeit currency and documents.
5. To prepare reports and present expert opinions in document cases.
6. Demonstrate knowledge of legal procedures and admissibility of document evidence in court.

Credits: 4

Hours: 60

Unit 1: Basics of Questioned Documents

15 hours

Definition of Questioned Document, Types of Questioned Document, Preliminary Examination of Questioned Document. Basic Tools Needed for Forensic Document Examination- Ultraviolet, Visible, Infrared, and Fluorescence Spectroscopy, Photomicrography, Microphotography, Visible Spectral Comparator, Electrostatic Detection Apparatus. Determining the Age and Relative Age of Documents. Instruments used in documents analysis-ESDA & VSC.

Unit 2: Fundamentals of Questioned Documents

15 hours

Characteristics of different types of documents: Handwritten documents, printed documents, typewritten documents, Charred Documents, Torn Documents. Merits and Demerits of Exemplar and Non-Exemplar Samples. Types, composition and examination of Paper & Ink. Comparison of Printed Documents, Typed Documents, Xeroxed Documents, Handwritten documents, Scanned Document.

Unit 3: Examination of Forgeries & Handwriting

15 hours

Basis of handwriting identification, Determination of sequence of strokes, Development of Individuality in Handwriting, Natural Variations and Fundamental Divergences in Handwriting, Features of Handwriting Class & Individual Characteristics. Methods of collection of handwriting samples. Comparison of Handwriting, Standards for Comparison of Handwriting. Types of writing instruments. Introduction to forgery and its types, identification and examination of forgery. Alterations in Documents, Including Erasures, Additions, Over-Writing, and Obliterations. Examination of Disguised writing and anonymous letters.

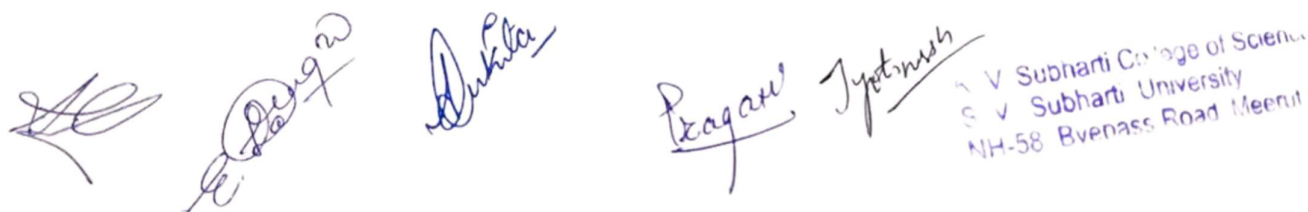
Unit 4: Examination of Security Documents

15 hours

Types of Security documents: Counterfeit Indian currency notes, passports, visas, stamp papers, credit card, visa, seal and other mechanical impressions. Examination & analysis of security features of different types of security documents. Ultra-violet light examination, transmitted light examination, Oblique light examination, and microscopic examination of security features.

Suggested Readings:

1. Rev. ED.; Ordway Hilton; *Scientific Examination. I of Questioned Documents*, Elsevier, New York.
2. Charles C. Thomas, I.S.Q.D. *Identification System for Questioned Documents*; Billy Prior Bates Springfield, Illinois, USA.
3. Wilson R. Harrison; *Suspect Documents - Their Scientific Examination*; Universal Law Publishing, Delhi.



4. *Hard less, H.R: Disputed Documents, handwriting and thumbs -print identification: profusely illustrated, Low Book Co., Allahabad.*
5. *Morris, Ron, N: Forensic handwriting identification, Acad Press, London.*

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S.No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30

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B. Sc. Forensic Science
Semester II
Forensic Dermatoglyphics

Credits: 4 **Hours: 60**

Course Title: Forensic Dermatoglyphics	Course Code: BSFS-202
Course Type: Major Theory, L-T-P: 4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes: *At the end of the course, the student should be able:*

1. To learn the basics and development of fingerprint science.
2. To define fingerprint classification systems.
3. To explain fingerprint development and analysis methods.
4. To understand the significance of foot, palm, ear, and lip prints.
5. To apply print evidence in personal identification and investigation.
6. To demonstrate knowledge of digital and automated fingerprint identification systems.

Credits: 4 **Hours: 60**

Unit 1: History & Basics of Fingerprint Science

15 hours

History and Development of Fingerprint Science, Main Function of Fingerprint Bureau, Biological significance of skin pattern, Ridge formation, Composition of sweat and secretion of sweat, Fingerprint Pattern types & Ridge characteristics, General and Individual characteristics of fingerprints. Ridge tracing, Ridge counting.

Unit 2: Recording and Classification of Fingerprints

15 hours

Plain and rolled prints, recording of rolled print. Recording of fingerprints from living and dead persons. Various systems for Fingerprint classification, Henry classification system, numerical value, symbol, primary classification, secondary classification, sub-secondary classification, key classification and final classification, National Crime Information Center (NCIC) classification, AFIS classification, Introduction to Automated Fingerprint Identification System (AFIS).

Unit 3: Development & Analysis of Fingerprints

15 hours

Latent Fingerprint- Identification, Development and Preservation, Chance prints, questioned prints, known prints, plain prints, plastic prints, patent print, latent print and rolled impressions, Conventional and unconventional methods to develop latent fingerprint, Direct or Inked prints, Development & Lifting techniques of Latent Prints, Physical & chemical Methods: Powder techniques & Various chemical techniques, Processing of Post developed prints. Fingerprint comparison & Identification. Modern methods of fingerprinting.

Unit 4: Footprints

15 hours

Types and Significance of Impression Evidence, Footwear/Footprints Impressions (General Characteristic), Casting of three-Dimensional Footwear/Footprints impressions, Comparison of footwear/Footprints impressions, Electrostatic lifting of latent foot prints. Gait pattern- Examination collection & significance. Lip & Ear prints - Types, Nature, location, collection preservation, examination & their significance. Palm prints & their historical importance.

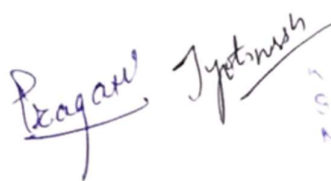
Suggested readings

1. E. Roland Menzel; *Fingerprint Detection, with Lasers, Second edition; Marcel, Dekker, Inc. USA.*
2. Mehta, M.K: *Identification of Thumb Impression & Cross Examination of Finger Prints, N. M. Tripathi (P) Ltd, Bombay.*
3. Chatterjee S.K., *Speculation in Finger print identification, Jantralekha, Printing Works, Kolkata.*
4. Cowger, James F: *Friction ridge skin: Comparison and Identification of Fingerprints; CRC Press, Boca Raton, New York.*
5. Lee and Gaensleen's, *Advances in Fingerprint Technology, 3rd Edition, R.S. Ramotowski (Ed.), CRC Press, Boca Raton (2013).*

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Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar
Formative Assessment

S.No.	Assessment Occasion	Weightage in	
1.	Attendance	05	
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total		30	



Subharti College of Science
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**B. Sc. Forensic Science
Semester II
General Physics-II**

Credits: 3 Hours: 45

Course Title: General Physics-II	Course Code: BSFS-203A
Course Type: Minor Theory, L-T-P: 3-0-0	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able:

1. To apply electrostatics to fields, potentials, and capacitance.
2. To analyse electric circuits using current electricity laws.
3. To explain magnetism and motion of charges in fields.
4. To differentiate types and properties of magnetic materials.
5. To describe basics of quantum, atomic, and nuclear physics
6. To illustrate the principles and applications of electromagnetic waves and radiation.

Credits: 3 Hours: 45

Unit 1 – Electrostatics

12 Hours

Coulomb’s law; Electric field and field lines; Properties and characteristics. Electric potential and potential difference; Relation between E and V; Gauss’s law and applications; Capacitance – principle and derivation for parallel plate capacitor, capacitors in series and parallel; Energy stored in capacitors and energy density.

Unit 2 – Current Electricity

11 Hours

Electric current, drift velocity; Ohm’s law and limitations; statement, limitations, and microscopic form; electrical resistivity and conductivity; effect of temperature on resistance. Electrical resistivity and conductivity; Series and parallel combinations of resistors; Kirchhoff’s laws; Kirchhoff’s current law (KCL) and voltage law (KVL) with simple circuit analysis. Wheatstone bridge; Potentiometer – principle and applications; Measurement of resistance and EMF.

Unit 3 – Magnetism

11 Hours

Magnetic field and magnetic flux; Biot–Savart law and applications; Ampere’s circuital law; Force on a current-carrying conductor; Lorentz force, force between two parallel current-carrying conductors, torque on a current loop in a uniform magnetic field. Motion of charged particles in magnetic field; circular motion, radius, frequency, velocity selector. Magnetic materials – diamagnetic, paramagnetic, ferromagnetic; Hysteresis curve.

Unit 4 – Modern Physics – Basics

11 Hours

Structure of atom – Rutherford’s model; Photoelectric effect: laws of photoelectric emission. Einstein’s photon theory, and applications (photo cells). X-rays – production, types, properties, and applications. de Broglie hypothesis; Davisson–Germer experiment; Nuclear Structure – basic properties of nucleus (size, mass, charge, density); constituents of nucleus; binding energy and its significance.

Suggested Readings:

1. *Electricity, Magnetism & Electromagnetic Theory*, S. Mahajan and Choudhury, 2012, Tata McGraw.
2. *Concepts of Modern Physics*, Arthur Beiser, 2002, McGraw-Hill.
3. *Electricity and Magnetism*, Edward M. Purcell, 1986 McGraw-Hill Education.
4. *Laser Fundamentals*, William T. Silfvast, 2008, Cambridge University Press.
5. *Physics of atoms and molecules*, B. H. Bransden and C. J. Joachain, 2003, Pearson.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

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1.	Attendance	05
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Total		30

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B. Sc. Forensic Science
Semester II
General Chemistry-II

Credits: 3

Hours: 45

Course Title: General Chemistry-II	Course Code: BSFS-203B
Course Type: Minor Theory, L-T-P: 3-0-0	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able:

1. To apply thermodynamic laws to analyse energy changes and spontaneity.
2. To explain solution properties and determine colligative effects.
3. To use equilibrium principles to predict and control chemical reactions.
4. To classify acids, bases, and buffers using pH concepts.
5. To describe preparation, properties, and uses of hydrocarbons
6. To understand fundamentals of chemical kinetics and factors influencing reaction rates

Credits: 3

Hours: 45

Unit 1 Chemical Thermodynamics

12 Hours

Zeroth, first, and second laws of thermodynamics Internal Energy and Enthalpy – definitions, units, relation between them, standard enthalpy changes in physical (fusion, vaporization) and chemical processes (formation, combustion, neutralization). Heat capacity: specific heat, molar heat capacity, C_p and C_v ; relation between C_p and C_v . Gibbs Free Energy – definition, Gibbs–Helmholtz equation, criteria for spontaneity and equilibrium. Entropy Entropy and its significance.

Unit 2 Solutions & Colligative Properties

11 Hours

Types of solutions: Solid, liquid, and gaseous solutions; expression of concentration (molarity, molality, mole fraction, mass percentage). Solubility factors: effect of temperature and pressure on solubility of solids and gases. Raoult's law; Vapor pressure of solutions; Colligative properties – elevation of boiling point, depression of freezing point, osmotic pressure; Determination of molar masses.

Unit 3 Chemical Equilibrium

11 Hours

Reversible and irreversible reactions. Law of mass action: derivation and relation between rate constants and equilibrium constant. Equilibrium constant (K_c and K_p): relation between them, effect of temperature and pressure, and applications. Le Chatelier's principle. Acid-Base Equilibria – ionic product of water (K_w), pH and pOH scales, weak and strong acids/bases. Ionic product of water, pH, buffers.

Unit 4 Hydrocarbons

11 Hours

Alkanes – preparation, properties (physical and chemical). Alkenes – preparation, properties (addition reactions, polymerization), Markovnikov's rule, and anti-Markovnikov addition. Alkynes – preparation, properties (addition and oxidation reactions), acidic nature of terminal alkynes. Aromatic Hydrocarbons – structure of benzene, resonance stability, mechanism of electrophilic substitution reactions. Uses of hydrocarbons in daily life and industry.

Suggested Readings:

1. *Physical Chemistry*, P. Atkins and J. De Paul, 8th Edition (2006), International Student Edition, Oxford University Press.
2. *Basic Concepts of Analytical Chemistry*, S.M.Khopkar, 2nd edition (1998), New Age International Publications, New Delhi.
3. *Essentials of Nuclear Chemistry* H. J. Arnika, 4th Edition (1995), New Age International (p) Ltd., Wiley Eastern Ltd., New Delhi.

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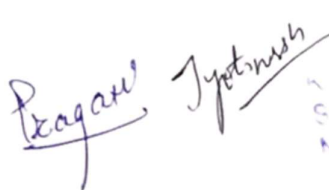
4. *Principles of Instrumental Analysis, D.A. Skoog, F.J.Holler and T.A. Nieman, , 5th edition (1998), Horcourt Brace & Company, Florida.*
5. *Modern Methods of Chemical Analysis', R.L. Pecscok, L.D. Shields, T. Cairns, and I.C. Mc William, 2nd Edition (197 6), John Willey, New York.*

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

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**B. Sc. Forensic Science
Semester II
General Biology-II**

Credits: 3 Hours: 45

Course Title: General Biology-II	Course Code: BSFS-203C
Course Type: Minor Theory, L-T-P: 3-0-0	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able to:

1. To apply Mendelian and non-Mendelian principles to explain inheritance patterns.
2. To identify animal tissue types and relate structure to function.
3. To explain human digestive and respiratory system processes.
4. To describe photosynthesis, respiration, and water transport in plants.
5. To relate physiological mechanisms to survival and adaptation in organisms.
6. To demonstrate understanding of cell structure, organelles, and their roles in life processes.

Credits: 3

Hours: 45

Unit 1 Genetics

12 Hours

Mendel's Experiments and Laws of Inheritance: Mendel's first law (Law of Segregation) and second law (Law of Independent Assortment). Monohybrid and Dihybrid Crosses – Punnett square analysis, phenotypic and genotypic ratios. Test Cross and Back Cross: applications in detecting genotype. Non-Mendelian Inheritance Patterns: Incomplete dominance, co-dominance, multiple alleles, pleiotropy.

Unit 2 Animal Tissue

11

Hours Epithelial Tissue – structure, types, and primary functions. Connective Tissues (Cartilage, Bone and Blood): structure and function. Muscular Tissue (skeletal, smooth, and cardiac muscle): structure and function. Nervous Tissue – structure and types of neurons; functions of glial cells in support, insulation, and repair; transmission of nerve impulses.

Unit 3: Human Physiology

11

Hours Digestive System – anatomy of alimentary canal and accessory glands. functions of mouth, oesophagus, stomach, small intestine, and large intestine; composition and role of digestive juices (salivary amylase, gastric juice, bile, pancreatic juice, intestinal enzymes). Respiratory System – structure of respiratory; mechanism of breathing (inspiration and expiration); lung volumes and capacities; transport of oxygen and carbon dioxide; regulation of respiration by respiratory centres.

Unit 4: Plant Physiology

11 Hours

Photosynthesis: light and dark reactions (Calvin cycle); photorespiration; adaptations in C3, C4, and CAM plants. Respiration in Plants. Krebs cycle steps; electron transport chain and oxidative phosphorylation; anaerobic respiration and fermentation in plants. Water Movement in Plants: absorption of water, apoplast and symplast pathways; ascent of sap (cohesion-tension theory); transpirational pull. Transpiration: types, factors affecting rate of transpiration, role in plant physiology; opening and closing of stomata.

Suggested Readings:

1. Douglas J. Futuyma (2020), Mark Kirkpatrick Evolution, 4th Edition, Oxford University Press Pelczar
2. William G. Hopkins, Norman P A Huner (2013) Introduction to Plant Physiology 4th Edition, Wiley India
3. Richard Crang, Sheila L. Sobaski (2018) Plant Anatomy: A Concept-Based Approach to the Structure of Seed Plants, 1st Edition, Springer
4. Elaine N. Marieb, Suzanne Keller (2017) Essentials of Human Anatomy & Physiology Global Edition, 12th Edition, Pearson Education

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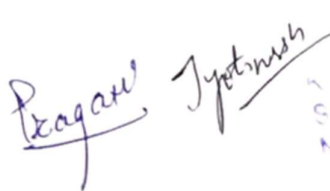
5. Jennifer L. Regan, Andrew F. Russo, Cinnamon L. VanPutte (2021) Seeley's Essentials of Anatomy and Physiology, 11th Edition. McGraw Hill.
6. T M Smith, R L Smith (2015) Elements of Ecology Global Edition, 9th Edition , Pearson Education India.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

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1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
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**B. Sc. Forensic Science
Multi-disciplinary Course
Disaster Victim Identification**

Credits: 3 Hours: 45

Course Title: Disaster Victim Identification	Course Code: M-DIS-DVI
Course Type: Multi-disciplinary Course, L-T-P: 3-0-0	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcome: After successful completion of the course, the student will be able to:

1. To explain the types of disasters and challenges in mass fatality incidents.
2. To describe forensic roles, ethics, and protocols in DVI.
3. To apply primary identification methods: fingerprints, dental records, and DNA.
4. To relate the disaster management cycle to DVI processes.
5. To summarize the evolution and current models of disaster victim identification.
6. To assess coordination and communication strategies in disaster victim identification.

Credits: 3 Hours: 45

Unit 1: Introduction to Disaster Victim Identification and Classification of Disasters 12 Hours

Definition and scope of disaster victim identification (DVI); objectives and importance of DVI in humanitarian and legal contexts; classification of disasters – natural disasters (earthquakes, floods, tsunamis, cyclones) and man-made disasters (terrorist attacks, transport accidents, industrial accidents); overview of mass fatality incidents; challenges in managing multiple fatalities in disaster scenarios.

Unit 2: Expertise and Considerations in Victim Identification 12 Hours

Roles and responsibilities of forensic experts in DVI operations; multidisciplinary team approach; legal, ethical, and cultural considerations in victim identification; handling of human remains; international guidelines and standards for DVI (e.g., INTERPOL DVI protocols); health and safety considerations for DVI personnel; communication with families and communities.

Unit 3: Methods of Identification 12 Hours

Primary methods of identification: fingerprint (friction ridge) analysis – techniques, databases, limitations and casework considerations; forensic odontology – dental records, charting, postmortem examination; DNA analysis – collection, preservation, comparison to reference samples, types of markers used; secondary methods of identification – personal effects, anthropological examination, medical implants.

Unit 4: Disaster Management Cycle and Evolution of DVI Operating Models 12 Hours

The disaster management cycle – mitigation, preparedness, response, recovery phases; DVI planning in each phase of the cycle; historical development and evolution of DVI operating models; lessons learned from past disasters; future directions and advancements in DVI techniques; importance of training, preparedness, and inter-agency collaboration.

Suggested Readings:

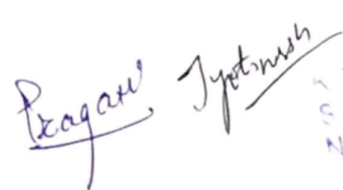
1. *Disaster Victim Identification: Experience and Practice (2020)* – Sue Black, Xanthe Mallett, and David Fowler; CRC Press
2. *Forensic Human Identification: An Introduction (2022)* – Tim Thompson and Sue Black, CRC Press
3. *Forensic Science and Humanitarian Action: Interacting with the Dead and the Living (2017)* – Roberto C. Parra, Sara Zapico, and Douglas H. Ubelaker; Wiley- Blackwell
4. *Mass Fatality Management Concise Field Guide (2018)* – Mary H. Dudley, CRC Press
5. *Forensic Odontology: Principles and Practice (2023)* – Thomas J. David, Elsevier

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S. No.	Assessment Occasion	Weightage in
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NH-58 Bvenass Road Meerut

1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30







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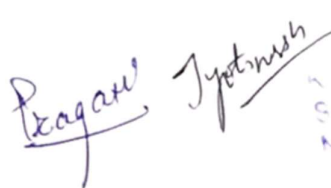
2. Krapohl, Daniel J., and John C. Kircher. *The Science of Polygraph Examination*. CRC Press, 2019.
3. Selvi, V. S. *Psychology and Law: An Introduction*. Sage Publications, 2014.
4. Yawer, Qazalbash. *Law of Lie Detectors: Narcoanalysis, Polygraphy, Brain Mapping, Brain Fingerprinting*. LexisNexis, 2016.
5. Ekman, Paul. *Telling Lies: Clues to Deceit in the Marketplace, Politics, and Marriage*. W.W. Norton & Company, 2009.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

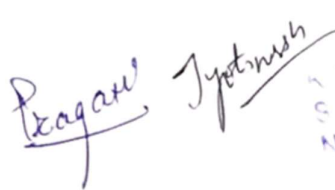

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Total			30



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Total	30
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B. Sc. Forensic Science
Skill Enhancement Course (SEC)
Basics of Handwriting Comparison

Credits: 3

Hours: 45

Course Title: Basics of Handwriting Comparison	Course Code: SEC-BHC
Course Type: Skill Enhancement Course, L-T-P:1-0-4	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course the student should be able to:

1. Understand the fundamental principles and scope of handwriting identification.
2. Analyze class and individual characteristics of handwriting.
3. Apply techniques to compare handwriting samples.
4. Evaluate forgery, counterfeiting, and altered documents.
5. Create systematic approaches using tools and methods for handwriting examination.
6. Interpret and present handwriting evidence to support investigations and legal proceedings.

Credits: 3

Hours: 45

Unit 1: Fundamentals of Handwriting Identification

12 hours

Principles, basis, and scientific approach to handwriting identification, Scope and significance of handwriting in forensic science and legal proceedings, Classification of handwriting features: class characteristics (common traits shared by groups) and individual characteristics (unique personal traits), Role of handwriting analysis in personal identification and document verification.

Unit 2: Characteristics of Handwriting

11 hours

General features: arrangement, alignment, margins, slant, speed, pressure, spacing, line quality, Special features: embellishments, movement, pen lifts, terminal strokes, connecting strokes, Influence of physical (age, health), mechanical (writing instrument, surface), genetic, and physiological (muscular coordination, nervous conditions) factors, Variability of handwriting and natural variations vs. disguises

Unit 3: Handwriting Examination and Comparison

11 hours

Methods and basis of handwriting comparison, Collection, preservation, and authentication of handwriting samples (standard, requested, and admitted writings), Systematic procedures in examining questioned documents, Use of magnifiers, stereomicroscope, comparison microscope, and digital tools for examination, Importance of consistency, natural variation, and elimination of bias in analysis

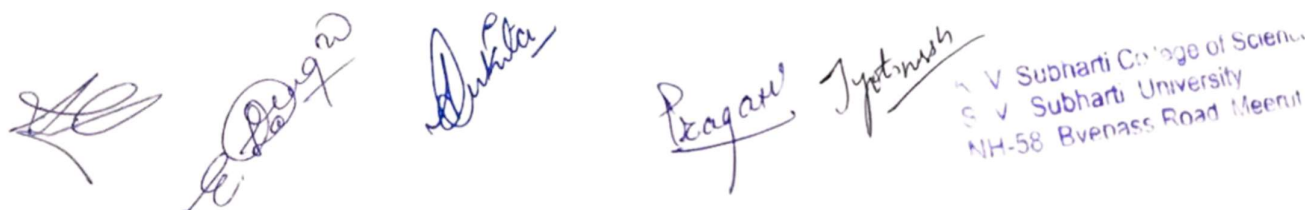
Unit 4: Detection of Forgery and Alterations

11 hours

Forgery: definition, principles, and types (simulated, traced, freehand, disguised), Counterfeiting: security features in documents and detection techniques, Examination of altered, erased, obliterated, and overwritten documents, Advanced techniques: UV/IR light examination, electrostatic detection apparatus (ESDA), VSC (Video Spectral Comparator), Role of forensic document examiner in expert testimony and casework.

Suggested Readings:

1. O. Hilton, *Scientific Examination of Questioned Documents*, CRC Press, Boca Raton (1982).
2. A.A. Moenssens, J. Starrs, C.E. Henderson and F.E. Inbau, *Scientific Evidence in Civil and Criminal Cases*, 4th Edition, Foundation Press, New York (1995).
3. R.N. Morris, *Forensic Handwriting Identification: Fundamental Concepts and Principles*, Academic Press, London (2000).

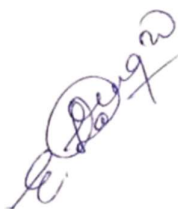


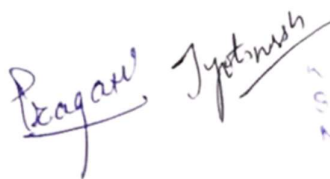
4. 4. E. David, *The Scientific Examination of Documents – Methods and Techniques*, 2nd Edition, Taylor & Francis, Hants (1997).
5. 5. Liu, Z. Q., Cai, J. H., & Buse, R. *Handwriting recognition: soft computing and probabilistic approaches (Vol. 133)*. Springer Science & Business Media (2003).

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S. No	Assessment Occasion		Weightage in
1.	Attendance		05
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		Mid semester test	15
Total			30



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**B. Sc. Forensic Science
Value Added Course (VAC)
Forensic Accounting**

Credits: 2 Hours: 30

Course Title: Forensic Accounting	Course Code: VAC-FA
Course Type: Value Added Course, L-T-P: 2-0-0	Course Credits: 2
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able to:

1. Understand the principles and practices of forensic accounting and its relevance in fraud detection.
2. Apply investigative and analytical techniques to detect and prevent financial irregularities.
3. Interpret legal frameworks and professional standards applicable to forensic accounting.
4. Analyze digital financial data and generate forensic accounting reports with professional integrity.
5. Integrate interdisciplinary tools and methods to support law enforcement and litigation processes.
6. Evaluate complex financial findings clearly while upholding ethical and professional standards.

Credits: 2 Hours: 30

Unit 1: Introduction to Forensic accounting

6 Hours

Definition, scope, and evolution of forensic accounting, Differences between forensic accounting, auditing, and fraud examination, Role of forensic accountants in corporate and legal environments, Types of fraud: asset misappropriation, financial statement fraud, corruption, Case studies on high-profile financial frauds.

Unit 2: Fraud Detection and Prevention Techniques

6 Hours

Fraud risk assessment and red flags, Internal controls and corporate governance, Data analytics and forensic software tools (ACL, IDEA), Benford's Law, ratio analysis, and trend analysis, Interviewing and interrogation techniques for fraud detection

Unit 3: Investigative Techniques and Legal Framework

6 Hours

Investigative process in forensic accounting, Evidence collection, documentation, and chain of custody, Indian laws related to financial fraud: IPC, CrPC, Companies Act, IT Act, International regulations: SOX Act, FCPA, AML frameworks, Role of enforcement agencies: CBI, SFIO, ED, SEBI, and FIUs

Unit 4: Digital and Cyber Forensics in Accounting

6 Hours

Digital records, emails, and e-documents in financial fraud, Cyber frauds involving digital payments, phishing, and blockchain misuse, Basics of IT audits and cyber audit trails, Role of data mining, AI, and machine learning in fraud detection Case studies of digital financial crimes

Unit 5: Reporting, Ethics, and Expert Testimony

6 Hours

Preparation of forensic accounting reports, Ethics, confidentiality, and professional responsibilities, Litigation support and role as expert witness in court, Cross-examination and admissibility of forensic evidence, Emerging trends and career opportunities in forensic accounting

Suggested Readings:

1. Zysman, A., & Kapasi, S. (2023). *The Forensic Accounting Handbook: Detecting Fraud in the Digital Age*. CRC Press.

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2. Srinivas, K. S., & Nair, R. (2022). *Forensic Accounting and Fraud Examination: Principles and Practice in India*. Taxmann.
3. Crumbley, D. L., Heitger, L. E., & Smith, G. S. (2021). *Forensic and Investigative Accounting (9th Edition)*. Wolters Kluwer.
4. AICPA Forensic and Valuation Services Section (2021). *AICPA Forensic Accounting Standards and Guidelines*.
5. Kranacher, M.-J., Riley, R. A., & Wells, J. T. (2022). *Forensic Accounting and Fraud Examination (3rd Edition)*. Wiley.
6. Hopwood, W., Young, G. R., & Leiner, J. (2020). *Forensic Accounting (3rd Edition)*. McGraw-Hill Education.
7. Institute of Chartered Accountants of India (ICAI) (2023). *Study Material on Forensic Accounting and Investigation Standards (FAIS)*.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S.No	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30

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B. Sc. Forensic Science
Semester II
Practical 2

Credits: 3 Hours: 90

Course Title: Practical 2	Course Code: BSFS-204P
Course Type: Practical, L-T-P: 0-0-6	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able:

1. To gain practical skills in forensic document and fingerprint analysis.
2. To understand key principles of physics through experimental verification.
3. To perform basic chemistry experiments on solutions, equilibrium, and hydrocarbons.
4. To explore biological concepts of genetics, inheritance, tissues, and biomolecules.
5. To develop scientific observation, analysis, and interpretation skills.
6. To apply laboratory safety protocols and proper handling of instruments and chemicals.

Credits: 3 Hours: 60

Questioned Documents Lab.

1. To identify individual and class characteristics of handwriting samples.
2. To study natural variations and compare the handwriting samples.
3. To Decipher the Secret handwriting.
4. To examine the security features of currency notes, passports and plastic money.
5. To study alterations, obliterations, and erasures in handwriting samples.

Forensic Dermatoglyphics Lab.

1. To record the plain and rolled fingerprint.
2. To carry out ten-digit classification of fingerprints by recording plain and rolled fingerprint.
3. To investigate the physical methods of fingerprint detection.
4. To investigate the chemical methods of fingerprint detection.
5. To trace the 2-dimensional footprint and cast the sunken foot prints.

General Physics-II

1. Verification of Ohm's law using a simple circuit.
2. Measurement of resistance using Wheatstone bridge.
3. Comparison of EMF of two cells using potentiometer.
4. Study of the magnetic field along the axis of a current-carrying circular coil (Biot-Savart law).
5. Verification of inverse square law in photoelectric effect (using photocell).

General Chemistry-II

1. Measurement of pH of different solutions using pH paper/pH meter (Equilibrium).
2. Simple acid-base titration (HCl vs NaOH) (Solutions).
3. Determination of melting and boiling point of organic compounds (Hydrocarbons).
4. Verification of Raoult's law using salt solution (Colligative property – simple demo).
5. Study of effect of temperature on solubility of a salt in water (Solutions).

General Biology-II

1. To study Mendel's monohybrid and dihybrid cross using charts.
2. To study examples of human traits showing inheritance (earlobe, tongue rolling, etc.).
3. To observe different types of epithelial tissue under the microscope.
4. To study nervous tissue and neuron structure under the microscope.
5. To test the presence of starch, glucose, and protein in food samples.

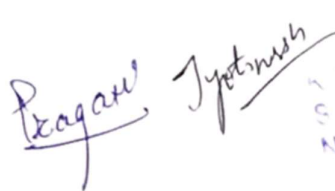
Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

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S.No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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II YEAR

SWAMI VIVEKANAD SUBHARTI UNIVERSITY MEERUT													
KERAL VERMA SUBHARTI COLLEGE OF SCIENCE													
Department of Forensic Science													
Course Name - B.Sc. Forensic Science													
Batch:2025-26				SEM:III									
S.No.	Course Type	Course Code	Course	Teaching Load			Credits	Internal Assessment	External Assessment	Total	Remark		
				L	T	P						Attendance (5)	quiz/PT/Assignment (10)
THEORY and PRACTICAL SUBJECTS													
1	Major 5	BSFS-301	Forensic Psychology	3	0	0	3	5	10	15	70	100	
2	Major 6	BSFS-302	Instrumental Techniques	3	0	0	3	5	10	15	70	100	
3	Minor 3	BSFS-303A	General Physics-III	3	0	0	3	5	10	15	70	100	
		BSFS-303B	General Chemistry-III										
		BSFS-303C	General Biology-III										
4	Multi Disciplinary 3	M-DIS-IB	Introduction to Biometry	3	0	0	3	5	10	15	70	100	
		M-DIS-FL	Forensic Linguistics										
5	Ability Enhancement Course 3	AEC-03	Disaster Risk Management	2	0	0	2	5	10	15	70	100	
6	Skill Enhancement Course 3	SEC-BC	Basics of Computers	1	0	4	3	5	10	15	70	100	
		SEC-MM	Multi-media Forensics										
7	Practical 3 (based on Major 3+4 + Minor 3)	BSFS-304P	Based on Major 3+4 +Minor 3	0	0	6	3	5	10	15	70	100	
TOTAL CREDITS / ASSESSMENT							20	35	70	105	490	700	

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SWAMI VIVEKANAD SUBHARTI UNIVERSITY MEERUT

KERAL VERMA SUBHARTI COLLEGE OF SCIENCE

Department of Forensic Science

Course Name - B.Sc. Forensic Science

Batch:2025-26

SEM:IV

S. No.	Course Type	Course Code	Course	Teaching Load			Credits	Attendance (5)	Internal Assessment quiz/PP T/ Assignment (10)	External Assessment		Total	Remark	
				L	T	P				Mid Sem Test (15)	End Sem Exam (70)			
THEORY and PRACTICAL SUBJECTS														
1	Major 7	BSFS-401	Forensic Physics	4	0	0	4	5	10	15	70	100		
2	Major 8	BSFS-402	Forensic Chemistry	4	0	0	4	5	10	15	70	100		
3	Major 9	BSFS-403	Forensic Biology & Serology	4	0	0	4	5	10	15	70	100		
4	Minor 4	BSFS-404A	General Physics-IV	3	0	0	3	5	10	15	70	100		
		BSFS-404B	General Chemistry-IV											
		BSFS-404C	General Biology-IV											
5	Practical 4 (based on Major (7+8+9+ Minor 4)	BSFS-405P	Based on Major7+8+9 + Minor 4	0	0	6	3	5	10	15	70	100		
6	Ability Enhancement Course 3	AEC-04A/B/C/D/E	(Course on NCC/NSS/NGO's/ Scout Guide / Sports)	2	0	0	2	5	10	15	70	100		
TOTAL CREDITS / ASSESSMENT								20	30	60	90	420	600	

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**B. Sc. Forensic Science
Semester III
Forensic Psychology**

Credits: 3

Hours: 45

Course Title: Forensic Psychology	Course Code: BSFS-301
Course Type: Major Theory;L-T-P:3-0-0	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able:

1. To understand the roles and ethical responsibilities of forensic psychologists.
2. To analyze theories of criminal behavior and apply psychological profiling techniques.
3. To evaluate the role of forensic psychology in investigations and legal proceedings.
4. To examine mental health conditions relevant to criminal responsibility and behavior.
5. To apply psychological principles in correctional settings to design offender rehabilitation strategies.
6. To use assessment tools and techniques to evaluate competency, risk, and credibility in forensic contexts.

Credits: 3

Hours: 45

Unit 1: Introduction to Forensic Psychology

12 Hours

Definition, scope, and history of forensic psychology; Roles and responsibilities of a forensic psychologist; Differences between forensic psychology and clinical psychology; Ethical considerations in forensic psychology; Major domains: criminal, civil, correctional, and police psychology; Legal standards of competence, insanity, and criminal responsibility; Introduction to Indian legal system and relevant IPC/CrPC sections.

Unit 2: Criminal Behavior and Psychological Profiling

11 Hours

Theories of criminal behavior: biological, psychological, sociological; Types of offenders: serial killers, psychopaths, sexual offenders, juveniles; Psychological autopsy and offender profiling techniques; Risk assessment and threat analysis; Role of mental illness in crime: schizophrenia, personality disorders; Interviewing techniques and interrogation (PEACE and Reid model); Lie detection: behavioral cues, voice stress analysis, and polygraph.

Unit 3: Psychology in Investigation and Courtroom

11 Hours

Role of forensic psychology in criminal investigation; Eyewitness testimony: reliability, factors affecting memory; False confessions and suggestibility; Jury decision-making and courtroom behavior; Competency and insanity evaluations; Victimology and trauma psychology; Children and vulnerable witnesses: suggestibility, protection measures.

Unit 4: Correctional and Rehabilitation Psychology

11 Hours

Psychological assessment in prisons and correctional facilities; Rehabilitation and treatment of offenders (CBT, anger management, etc.); Juvenile delinquency: causes, intervention strategies; Substance abuse and criminality; Role of forensic psychologist in correctional settings; Counseling techniques and behavior modification; Recidivism and reformation strategies.

Suggested Readings:

1. Bartol, C. R., & Bartol, A. M. (2021). *Introduction to Forensic Psychology: Research and Application (6th Edition)*. SAGE Publications.
2. Pozzulo, J. D., Bennell, C., & Forth, A. E. (2022). *Forensic Psychology (6th Edition)*. Pearson Education.

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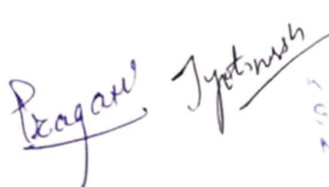
3. Gudjonsson, G. H. (2018). *The Psychology of Interrogations and Confessions: A Handbook (2nd Edition)*. Wiley-Blackwell.
4. Kapardis, A. (2021). *Psychology and Law: A Critical Introduction (5th Edition)*. Cambridge University Press.
5. Sarma, K., & Storey, J. (2019). *Forensic Psychology: Theory, Research, Policy, and Practice (1st Edition)*. Oxford University Press.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S.No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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**B. Sc. Forensic Science
Semester III
Instrumental Techniques**

Credits: 3 Hours: 45

Course Title: Instrumental Techniques	Course Code: BSFS-302
Course Type: Major Theory; L-T-P: 3-0-0	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able:

1. To understand the principles and forensic applications of chromatographic techniques.
2. To apply spectroscopic methods for the identification and analysis of forensic substances.
3. To demonstrate knowledge of electrophoresis, colorimetry, and NAA in forensic testing.
4. To identify and examine forensic samples using various microscopic and imaging techniques.
5. To apply analytical instruments in forensic investigations
6. To evaluate the reliability, limitations, and admissibility of instrumental evidence in forensic science.

Credits: 3 Hours: 45

Unit 1: Chromatographic Techniques

12 Hours

Basic principles and types of chromatography. Introduction to Thin Layer Chromatography (TLC), Gas Chromatography (GC), and High-Performance Liquid Chromatography (HPLC). Sample preparation methods. Forensic applications in the analysis of drugs, explosives, and toxic substances.

Unit 2: Spectroscopic Techniques

11 Hours

Basic concepts of spectroscopy. Introduction to Ultraviolet-Visible (UV-Vis) Spectroscopy, Infrared (IR) Spectroscopy, Atomic Absorption Spectroscopy (AAS), and Mass Spectrometry (MS). Use of these techniques in forensic analysis of chemicals, poisons, and trace evidence.

Unit 3: Electrophoresis and Other Techniques

11 Hours

Introduction to electrophoresis and its types – gel and paper electrophoresis. Basic understanding of colorimetry and Lambert-Beer law. Overview of Neutron Activation Analysis (NAA). Forensic use in DNA, blood, and chemical analysis.

Unit 4: Microscopy and Imaging Techniques

11 Hours

Basic principles of microscopy. Types of microscopes: simple, compound, stereomicroscope, and comparison microscope. Introduction to Electron Microscopes (SEM, TEM). Forensic applications in the analysis of hair, fibers, documents, and gunshot residues.

Suggested Readings:

1. Sharma, B. (2022). *Instrumental Methods of Chemical Analysis (27th Edition)*. Goel Publishing House.
2. Roux, C., Bull, S., & Crispino, F. (2023). *Fundamentals of Forensic Science Instrumentation and Techniques*. Academic Press.
3. Sharma, R. K., & Sharma, R. (2021). *Analytical Techniques in Forensic Science*. Wiley.
4. Jain, R., & Pundir, C. S. (2022). *Modern Analytical Techniques in Forensic Science*. Springer.
5. Saferstein, R. (2023). *Forensic Science Handbook: Volume II, Instrumental Analysis and Applications (3rd Edition)*. CRC Press.
6. UNODC (2022). *Guidelines on Quality Assurance and Instrument Calibration for Forensic Laboratories*. United Nations Publication.

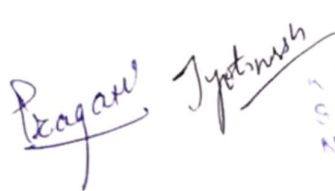
Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S.No.	Assessment Occasion	Weightage in
1.	Attendance	05

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2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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**B. Sc. Forensic Science
Semester III
General Physics-III**

Credits: 3 Hours: 45

Course Title: General Physics-III	Course Code: BSFS-303A
Course Type: Minor Theory, L-T-P: 3-0-0	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able:

1. To apply geometrical optics principles to image formation and optical instruments.
2. To explain interference, diffraction, and polarization with practical applications.
3. To analyse sound propagation, Doppler effect, and acoustics in buildings.
4. To describe properties, decay laws, and applications of radioactivity.
5. To relate theoretical optics, acoustics, and nuclear concepts to real-world uses.
6. To solve quantitative problems using principles of optics, acoustics, and nuclear physics.

Credits: 3

Hours: 45

Unit 1: Optics (Geometrical)

12 Hours

Laws of Reflection and Refraction – fundamental principles, Snell’s law, Refraction through Plane and Spherical Surfaces – derivations for image formation; refraction at a single spherical surface; refraction by lenses. Lenses and Lens Combinations. Magnification – linear and angular. Optical Instruments – working principles. Defects of Images – spherical and chromatic aberrations; methods of correction. Prism Deviation and Dispersion – minimum deviation, dispersive power, applications in spectroscopy.

Unit 2: Optics (Physical)

11 Hours

Interference – conditions for constructive/destructive interference, Young’s double-slit experiment, fringe width, applications; thin-film interference and colors in soap bubbles/oil films. Diffraction – Fresnel and Fraunhofer diffraction; single slit and diffraction grating, resolving power. Polarization – polarization by reflection, double refraction in calcite crystal, use of polaroids; applications in stress analysis, glare reduction, and 3D imaging.

Unit 3: Sound and Acoustics

11 Hours

Nature and Propagation of Sound – longitudinal waves, speed of sound in gases and solids, factors affecting velocity. Beats – principle, applications in tuning instruments. Doppler Effect – formulae for source and observer in motion, applications in radar and astronomy. Acoustics of Buildings – reverberation time, Sabine’s formula, absorption coefficients, methods of soundproofing and noise control.

Unit 4: Radioactivity

11 Hours

Properties of α , β , γ Radiations – nature, penetration power, ionizing ability. Radioactive Decay Law – exponential decay equation and units of radioactivity. Half-life and Mean Life – relation between them, examples. Nuclear Fission and Fusion – principle, energy release, applications in reactors and stars. Applications of Radioisotopes – tracers in medicine, industry quality control, archaeological dating (carbon dating).

Suggested Readings:

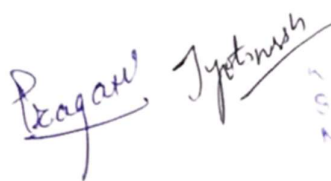
1. Hecht, E. (2015). *Optics (5th ed.)*. Pearson.
2. Jenkins, F. A., & White, H. E. (1976). *Fundamentals of optics (4th ed.)*. McGraw-Hill.
3. Kinsler, L. E., Frey, A. R., Coppens, A. B., & Sanders, J. V. (2000). *Fundamentals of acoustics (4th ed.)*. Wiley.
4. Krane, K. S. (2012). *Modern physics (3rd ed.)*. Wiley.
5. Tipler, P. A., & Mosca, G. (2003). *Physics for scientists and engineers (6th ed.)*. W. H. Freeman.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

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Formative Assessment

S.No.	Assessment Occasion	Weightage in	
1.	Attendance	05	
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total		30	



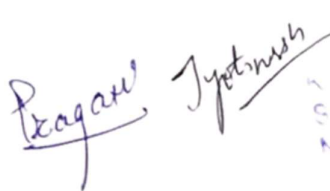

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5. Pavia, D. L., Lampman, G. M., Kriz, G. S., & Engel, R. G. (2004). *Introduction to organic laboratory techniques: A small-scale approach (2nd ed.)*. Brooks Cole.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

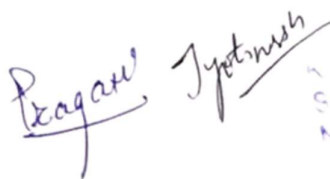
S.No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
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Total			30



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Formative Assessment

S.No.	Assessment Occasion	Weightage in	
1.	Attendance	05	
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total		30	



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B. Sc. Forensic Science
Multi-disciplinary Course
Introduction to Biometry

Credits: 3 **Hours: 45**

Course Title: Introduction to Biometry	Course Code: M-DIS-IB
Course Type: Multi-disciplinary Course, L-T-P: 3-0-0	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcome: After successful completion of the course, the student will be able:

1. To describe the concepts, processes, and types of biometric systems.
2. To explain the strengths, limitations, and applications of physiological and behavioral biometrics.
3. To apply biometric techniques for identification, verification, and authentication.
4. To analyze biometric system performance using standard metrics.
5. To evaluate the challenges, ethical considerations, and emerging trends in biometric technology.
6. To design and integrate biometric solutions for practical security and forensic applications.

Credits: 3 **Hours: 45**

Unit 1: Fundamentals of Biometric Systems

12 Hours

Definition, characteristics, and working principles of biometric systems. Classification into physiological and behavioral biometrics. Concept of multimodal biometrics and key processes: enrollment, identification, and verification. Performance measures used in biometric systems including FAR, FRR, GAR, FTA, FTE, and ATV. Comparison of biometric systems with traditional identification methods and their applications.

Unit 2: Physiological Biometrics

12 Hours

Fingerprint and palm print recognition. Iris and retina recognition techniques. Hand geometry and face recognition systems. Applications, advantages, and limitations of physiological biometrics in security and forensic contexts.

Unit 3: Behavioral Biometrics

12 Hours

Handwriting and signature analysis. Keystroke dynamics and typing patterns. Gait and voice recognition systems. Applications, advantages, and challenges of behavioral biometrics in authentication and forensic investigation.

Unit 4: Applications and Emerging Trends

12 Hours

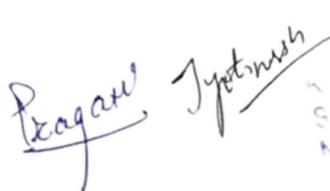
Accuracy and validity of deception detection techniques (Instrumental and Non-instrumental techniques). Role of deception detection in criminal investigation. Admissibility of lie detection tests in courts. Consent and voluntariness: Ethical considerations: Psychological harm, self-incrimination, bias, misuse, Conflict between truth-seeking and rights-protection, Data privacy and confidentiality.

Suggested Readings:

1. Jain, Anil K., Arun Ross, Karthik Nandakumar. *Introduction to Biometrics*. Springer, 2011.
2. Maltoni, Davide, et al. *Handbook of Fingerprint Recognition*. Springer, 2009.
3. Bowyer, Kevin W., Patrick Flynn. *Biometric Systems: Technology, Design and Performance Evaluation*. Springer, 2015.
4. Li, Stan Z., Anil K. Jain. *Handbook of Face Recognition*. Springer, 2011.
5. Wayman, James L., et al. *Biometric Systems: Technology, Design and Performance Evaluation*. Springer, 2005.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

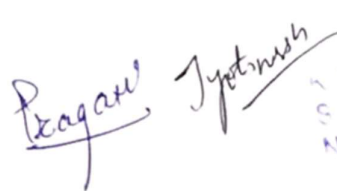
Formative Assessment



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S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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B. Sc. Forensic Science
Multi-disciplinary Course
Forensic Linguistics

Credits: 3 **Hours: 45**

Course Title: Forensic Linguistics	Course Code: M-DIS-FL
Course Type: Multi-disciplinary Course, L-T-P: 3-0-0	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcome: After successful completion of the course, the student will be able to:

1. Define key concepts, origin, and scope of Forensic Linguistics.
2. Explain the features and functions of legal language in various legal and police contexts.
3. Analyze linguistic ambiguity, misinterpretation, and power dynamics in legal communication.
4. Apply methods of authorship, linguistic profiling, and forensic stylistics to identify linguistic evidence.
5. Examine phonetic and sociolinguistic cues for speaker identification.
6. Evaluate ethical issues and case studies in forensic practice.

Credits: 3 **Hours: 45**

Unit 1: Introduction to Forensic Linguistics

12 Hours

Definition, concept, origin, and development of Forensic Linguistics. Significance and scope of Forensic Linguistics. Historical development and key milestones in the field. Structure and characteristics of legal language: archaic vocabulary, complex syntax, and modality. Overview of linguistic evidence in legal contexts. Relationship between linguistics and law. Role of the forensic linguist as an expert witness.

Unit 2: Forensic Phonetics and Speaker Identification

12 Hours

Principles and methods of forensic phonetics. Acoustic and auditory analysis of speech. Speech signal processing and spectrographic analysis. Distinguishing between voice similarity and speaker identity. Effects of disguise, stress, and recording quality on voice analysis. Comparison of questioned and known voice samples. Use of automatic speaker recognition (ASR) systems and AI tools.

Unit 3: Authorship Attribution and Linguistic Evidence

12 Hours

Authorship identification through linguistic style and vocabulary. Principles of authorship attribution. Lexical, syntactic, and stylistic features for identifying authors. Idiolect and personal writing style analysis. Quantitative vs. qualitative approaches in authorship identification. Stylistic markers: word choice, sentence structure, punctuation, and spelling patterns. Sociolinguistic profiling: linking writing style to demographic or social characteristics.

Unit 4: Ethical Issues and Professional Responsibilities

12 Hours

Confidentiality, impartiality, and objectivity in forensic practice. Legal and ethical responsibilities in protecting client and subject information. Forensic analysis of social media, emails, and online speech. Automatic speaker recognition (ASR) and machine learning in phonetics. Digital speech analysis in social media and online communication. Evaluating the reliability of digital speech samples. Challenges and limitations of modern forensic phonetics.

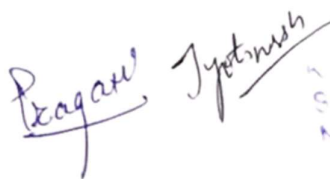
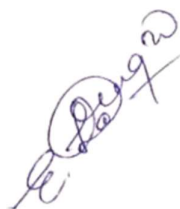
Suggested Readings:

1. Coulthard, M. & Johnson, A. (2010). *An Introduction to Forensic Linguistics: Language in Evidence*. Routledge.
2. Olsson, J. (2008). *Forensic Linguistics: An Introduction to Language, Crime and the Law*. Continuum.
3. Gibbons, J. (2003). *Forensic Linguistics: An Introduction to Language in the Justice System*. Blackwell.
4. Shuy, R. (1993). *Language Crimes: The Use and Abuse of Language Evidence in the Courtroom*. Blackwell.
5. Turell, M. T. (Ed.). (2010). *Dimensions of Forensic Linguistics*. John Benjamins.

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Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar
Formative Assessment

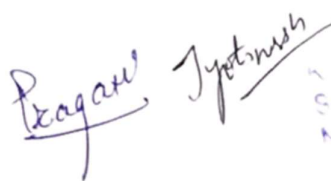
S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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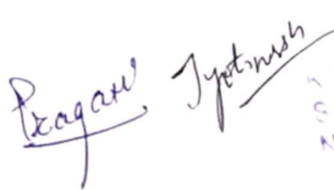
Formative Assessment

S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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Total	30
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**B. Sc. Forensic Science
Semester III
Practical 3**

Credits: 3 Hours: 90

Course Title: Practical 3	Course Code: BSFS-304P
Course Type: Practical, L-T-P: 0-0-6	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): *At the end of the course, the student should be able:*

1. To apply forensic psychology in profiling, lie detection, and case analysis.
2. To use microscopy, chromatography, spectroscopy, HPLC, and electrophoresis in analysis.
3. To verify principles of optics, waves, and sound in physics experiments.
4. To perform experiments on kinetics, electrochemistry, and water analysis in chemistry.
5. To study genetics, blood cells, ecosystems, and soil properties in biology.
6. To develop skills in recording, interpreting, and reporting experimental observations accurately.

Credits: 3

Hours: 90

Forensic Psychology Lab

1. To summarize the role of a forensic psychologist in criminal, civil, and correctional cases.
2. To explain the steps of psychological profiling in criminal investigations.
3. To outline methods of lie detection in criminal investigation.
4. To examine factors influencing eyewitness testimony through group activities.
5. To discuss causes and interventions for juvenile delinquency using case examples.

Instrumental Techniques Lab

1. To study the instrumentation of simple and compound microscope
2. To carry out the separation of amino acids by thin layer chromatography.
3. To understand the basic working principle and forensic applications of High-Performance Liquid Chromatography (HPLC).
4. To explain the fundamental principle and uses of Infrared (IR) Spectroscopy in chemical analysis.
5. To illustrate the principle and process of Gel Electrophoresis for separation of molecules.

General Physics-III

1. To demonstrate the laws of reflection using a plane mirror.
2. To study image formation and magnification using a convex lens.
3. To determine the wavelength of light using a diffraction grating
4. To determine the velocity of sound in air using a resonance tube.
5. To study the reverberation characteristics of a room (basic sound level observation)

General Chemistry-III

1. To determine the rate of hydrolysis of methyl acetate in the presence of an acid catalyst.
2. To calculate the activation energy of a chemical reaction using the Arrhenius equation.
3. To study the standard electrode potential of zinc/copper using the standard hydrogen electrode.
4. To measure the specific and molar conductance of strong electrolytes at different concentrations.
5. To determine the hardness of water using EDTA complexometric titration ($\text{Ca}^{2+}/\text{Mg}^{2+}$ ions).

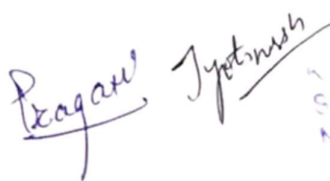
General Biology-III

1. To analyze pedigree charts for sex-linked traits such as color blindness.
2. To study karyotypes and identify chromosomal abnormalities (e.g., Down's syndrome, Turner's syndrome).
3. To study the microscopic structure of blood smears (RBCs, WBCs, platelets).
4. To study the biotic components of an ecosystem (plants, insects, soil organisms) in a quadrat.
5. To measure the pH, moisture, and temperature of soil samples from different sites.

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Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar
Formative Assessment

S.No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



Subharti College of Science
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**B. Sc. Forensic Science
Semester IV
Forensic Physics**

Credits: 4 Hours: 60

Course Title: Forensic Physics	Course Code: BSFS-401
Course Type: Major Theory, L-T-P: 4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): *At the end of the course, the student should be able:*

1. *To identify and analyze glass and paint evidence using physical, chemical, and instrumental methods.*
2. *To classify and compare soil and fiber evidence for forensic linkage.*
3. *To preserve and examine tire and footprint impressions to support criminal identification.*
4. *To differentiate tool marks and perform forensic restoration of erased markings*
5. *To apply scientific techniques to interpret trace evidence in real case investigations.*
6. *To prepare and present forensic reports that are clear and legally admissible.*

Credits: 4 Hours: 60

Unit 1: Glass Evidence and Paint Evidence

15Hours

Types of glass and their composition, Physical and optical properties of glass, Fracture patterns, Direction and force of impact, Glass Refractive Index Measurement(GRIM), Becke line method, Collection and preservation of glass evidence, Comparison and interpretation of glass fragments. Introduction, Composition, Manufacture of Paint, types of paint, Forensic Examination of Paints and Coatings: Collection and Preservation of paint samples, macroscopic and microscopic techniques for the characterization of Paint Fragments, Physical, Chemical & Instrumental analysis of paint (FTIR, SEM-EDS, micro spectrophotometry), interpretation of Paint Evidence

Unit 2: Soil Evidence and Fiber Evidences

15 Hours

Soil and its composition, Classification of soil, Soil color, texture, pH, moisture, and mineral content, Collection and preservation of soil samples, Density gradient method, Particle size analysis, Instrumental analysis of soil, Comparative analysis for forensic linkage. Composition and classification of soil, Physical and chemical characteristics of soil. Fiber evidence – artificial and man-made fibers. Collection of fiber evidence. Identification and comparison of fibers. Cloth evidence – importance, collection, analysis of adhering material. Matching of pieces

Unit 3: Tire Impressions and Footprints

15Hours

Introduction to tire impressions, Collection, Preservation, Forensic Significance of skid marks, Forensic Examination for identification and comparison, Case Studies. Footprints & Shoe impression examination: Introduction to footprints & Shoe impression, locating impressions at the scene of crime, Evidence collection: Collection, Lifting/Casting and Preservation of foot/footwear impressions, importance of Gait pattern, Forensic Identification and Methods of comparison


Unit 4: Toolmarks and Restoration of Erased Marks

15 Hours

Introduction to tool marks, Types of tool marks, Class characteristics and individual characteristics of tool marks, Striated and impressed toolmarks, Casting and photographic documentation of toolmarks, Collection and Preservation of tool marks, Forensic examination of tool marks, Case Studies. Erased marks: Principle of restoration of erased marks, Techniques involved for alteration of individual markings, Restoration of erased and obliterated marks on various surfaces, Photography and Forensic assessment of methods for restoration of obliterated marks, case studies.

Suggested Readings:

1. *Saferstein, R. (2023). Forensic Science: From the Crime Scene to the Crime Lab (5th Edition). Pearson.*


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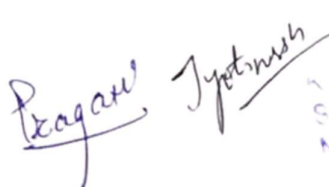
2. Houck, M. M., & Siegel, J. A. (2018). *Fundamentals of Forensic Science (3rd Edition)*. Academic Press.
3. De Forest, P., Gaensslen, R. E., & Lee, H. C. (2020). *Forensic Science: An Introduction to Criminalistics (2nd Edition)*. McGraw Hill.
4. Caddy, B. (Ed.). (2020). *Forensic Examination of Glass and Paint: Analysis and Interpretation (2nd Edition)*. CRC Press.
5. James, S. H., Nordby, J. J., & Bell, S. (2022). *Forensic Science: An Introduction to Scientific and Investigative Techniques (5th Edition)*. CRC Press.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S.No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



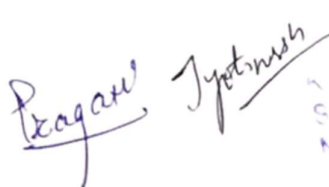
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5. UNODC Guidelines: Recommended Methods for the Identification and Analysis of Illicit Drug.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

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1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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B. Sc. Forensic Science
Semester IV
Forensic Biology and Serology

Credits: 4

Hours: 60

Course Title: Forensic Biology and Serology	Course Code: BSFS-403
Course Type: Major Theory, L-T-P: 4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes: At the end of the course, the student should be able:

1. Learn about the significance of biological evidences.
2. Understand the importance of algae, fungi and diatoms.
3. Elaborate the concept of wildlife forensics.
4. Learn basic principles of toxicology.
5. Study and understand the concepts of mechanism of toxicity.
6. Apply biological and toxicological knowledge to interpret forensic case evidence.

Credits: 4

Hours: 60

Unit 1: Biological Evidences

15 hours

Definition and scope of Forensic biology. Forensic evaluation of botanical evidences (pollen grains, leaves, seeds, woods). Hair: morphology, growth cycle, human vs. animal hair, collection and microscopic examination, determination of origin (race, sex, body site). Diatoms: types, morphology, extraction from tissues/bones, significance in drowning cases.

Unit 2: Antigens and Antibodies

15 hours

Structure and compositions of Antigens and Antibodies. Antigen-antibody interactions; Agglutination, precipitation, and flocculation. Species of origin using precipitin assays and immune-chromatographic assays. Blood and its composition, History and genetics of ABO and Rh blood grouping system and its significance in forensic investigation, Other forensically relevant blood group such as MN, I, P, Kell, Duffy, Kidd, Lewis, Lutheran and Bombay blood group, Secretors and non-secretors, HLA antigens and its importance.

Unit 3: Serological Evidences

15 hours

Types of serological evidences (Blood, Semen, Saliva, Urine, faecal matter)- composition, collection, preservation, and packaging. Identification of serological evidences: Presumptive and confirmatory test. Semen: morphology of spermatozoa, collection, evaluation, and forensic analysis.

Unit 4: Bloodstain Pattern Analysis (BPA)

15 hours

Bloodstain Pattern Analysis (BPA)- History, evolutions, and scope. Mechanism of blood droplet flight: passive, projected, transfer, and altered stains. Factors affecting bloodstain formation: angle of impact, velocity, surface texture, and height of fall. Bloodstain documentation techniques: photography, sketches, notes, and software-assisted mapping.

Suggested Readings:

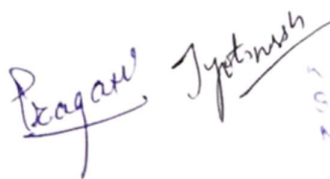
1. Jenkins and White; *Fundamentals of Optics*; McGraw Hill; Fourth Ed, (I) James, S.H. And Nordby, J. J.; *Forensic Science; An Introduction to Scientific and Investigative Techniques*, CRC Press USA
2. J A Seigel, P. JSaukoo and G C Knupfer; *Encyclopedia of Forensic Sciences Vol. I, II and III*, Acad. Press
3. *Criminalistics: An Introduction to Forensic Science (2014)* Saferstein, Pearson Prentice Hall Inc. USA, ISBN-13: 978-0133458824
4. *The examination and Typing of Blood Stains in the crime laboratory*-BJCulliford, U.S.Dept. of Justice, Washington D. C.
5. *Blood Group Serology* - Boorman KE, Dodd BE and LOncoln PJ, ChuchillLivingstoneInc. New York.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

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Formative Assessment

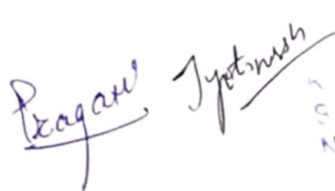
S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30

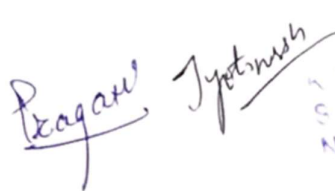


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S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30

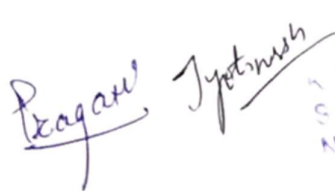


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S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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B. Sc. Forensic Science
Semester IV
Practical 4

Credits: 3

Hours: 90

Course Title: Practical 4	Course Code: BSFS-405P
Course Type: Practical, L-T-P: 0-0-6	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able:

1. To analyse forensic evidence like glass, soil, fibers, hair, blood, and explosives.
2. To use microscopy, chromatography, and serology for forensic analysis.
3. To verify concepts of electricity, magnetism, nuclear energy, and electronics.
4. To perform chemical experiments on compounds, reactions, acidity, and water quality.
5. To study DNA, tissues, karyotypes, muscle contraction, and ecosystems.
6. To record, interpret, and present experimental and forensic findings accurately.

Credits: 3

Hours: 90

Forensic Physics Lab.

1. To study fracture patterns in glass for determining the direction of force of impact.
2. To examine paint fragments using microscopic techniques for forensic comparison.
3. To analyze soil samples for physical properties (color, texture, and moisture content).
4. To prepare and study casts of shoe/foot impressions using plaster of Paris
5. To study the microscopic characteristics of natural and synthetic fibers.

Forensic Chemistry Lab.

1. To determine the flash point of an ignitable liquid sample.
2. To carry out analysis of gasoline.
3. To separate explosive substances using thin layer chromatography.
4. To practice collection and preservation methods of post-blast residues.
5. To detect common adulterants in food items (milk, butter, ghee, oils, and spices).

Forensic Biology & Serology Lab

1. To examine the morphology of human and animal hair under a microscope for forensic comparison.
2. To extract and identify diatoms from water samples/tissues and establish their forensic significance in drowning cases.
3. To determine human blood groups (ABO and Rh systems)
4. To perform the preliminary and confirmatory tests for blood identification.
5. To identify the given stain as saliva.

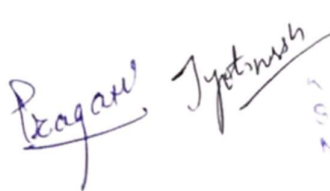
General Physics IV

1. To study the magnetic field around a current-carrying conductor using Oersted's experiment.
2. To demonstrate Faraday's Law of Electromagnetic Induction using coil and magnet experiments.
3. To determine RMS and peak values of an AC signal using experimental setup.
4. To calculate energy released in nuclear reactions and verify the relation $E = mc^2$.
5. To determine input and output characteristics of a transistor in common-emitter configuration.

General Chemistry IV

1. To study isomerism in coordination compounds (structural and stereoisomers).
2. To study the hydrolysis of esters in acidic and basic medium.
3. To determine the percentage of Fe^{2+} in Mohr's salt by titration with $KMnO_4$.
4. To compare the acidity of acetic acid and benzoic acid by pH measurement/conductometry.
5. To determine the dissolved oxygen (DO) content of a water sample.

General Biology IV



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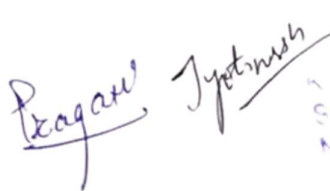
1. To isolate DNA from plant material (e.g., onion/banana) using simple extraction methods.
2. To study permanent slides of root, stem, and leaf structures of monocots and dicots.
3. To study the effect of temperature on muscle contraction.
4. To study karyotypes and identify chromosomal abnormalities (e.g., Down's syndrome, Turner's syndrome).
5. To measure water quality parameters (pH, dissolved oxygen, turbidity) of a local aquatic ecosystem.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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III YEAR

SWAMI VIVEKANAD SUBHARTI UNIVERSITY MEERUT														
KERAL VERMA SUBHARTI COLLEGE OF SCIENCE														
Department of Forensic Science														
Course Name - B.Sc. Forensic Science														
Batch:2025-26				SEM:V										
S.No.	Course Type	Course Code	Course	Teaching Load			Credits	Internal Assessment	External Assessment	Total	Remark	THEORY and PRACTICAL SUBJECTS		
				L	T	P								
								Attendance (5)	quiz/PPT/Assignment (10)	Mid Sem Test (15)	End Sem Exam (70)			
1	Major 10	BSFS-501	Forensic Medicine	4	0	0	4	5	10	15	70	100		
2	Major 11	BSFS-502	Forensic Toxicology	4	0	0	4	5	10	15	70	100		
3	Minor 5	BSFS-503A	General Physics-V	3	0	0	3	5	10	15	70	100		
		BSFS-503B	General Chemistry-V											
		BSFS-503C	General Biology-V											
4	Minor 6	BSFS-504	DNA Fingerprinting	3	0	0	3	5	10	15	70	100		
5	Internship	BSFS-505I	Internship	0	0	8	4	5	10	15	70	100		
6	Practical 5 (based on Major (10+11 Minor 5)	BSFS-506P	Based on Major 10+11 Minor 5	0	0	4	2	5	10	15	70	100		
TOTAL CREDITS / ASSESSMENT							20	30	60	90	420	600		

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SWAMI VIVEKANAD SUBHARTI UNIVERSITY MEERUT

KERAL VERMA SUBHARTI COLLEGE OF SCIENCE

Department of Forensic Science

Course Name - B.Sc. Forensic Science

Batch:2025-26			SEM:VI										
S.No.	Course Type	Course Code	Course	Teaching Load			Credits	Attendance (5)	Internal Assessment		External Assessment	Total	Remark
				L	T	P			Quiz/ PPT/ Assignment (10)	Mid Sem Test (15)	End Sem Exam (70)		
THEORY and PRACTICAL SUBJECTS													
1	Major 12	BSFS-601	Forensic Ballistics	4	0	0	4	5	10	15	70	100	
2	Major 13	BSFS-602	Forensic Anthropology	4	0	0	4	5	10	15	70	100	
3	Major 14	BSFS-603	Digital Forensics	4	0	0	4	5	10	15	70	100	
4	Minor 7	BSFS-604A	General Physics-VI	3	0	0	3	5	10	15	70	100	
		BSFS-604B	General Chemistry-VI										
		BSFS-604C	General Biology-VI										
5	Minor 8	BSFS-605	Forensic Entomology & Wildlife Forensics	3	0	0	3	5	10	15	70	100	
6	Practical 6 (based on Major (12+13+14+ Minor 7+8)	BSFS-606P	Based on Major (12+13+14+ Minor 7+8)	0	0	4	2	5	10	15	70	100	
TOTAL CREDITS / ASSESSMENT							20	30	60	90	420	600	

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**B. Sc. Forensic Science
Semester V
Forensic Medicine**

Credits: 4

Hours: 60

Course Title: Forensic Medicine	Course Code: BSFS-501
Course Type: Major Theory,L-T-P:4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes: At the end of the course, the student should be able:

1. To learn about duties of the medical responders in a crime scene
2. To understand the steps involved in processing the death scene.
3. To define importance of bloodstain patterns in reconstructing the crime scene.
4. To learn about steps involved in autopsy and its role in crime solving.
5. To understand the importance of forensic odontology.
6. To apply forensic principles to document and preserve evidence for legal proceedings

Credits: 4

Hours: 60

Unit 1: Fundamental Aspects & Scope of Forensic Medicine

15 Hours

Fundamental aspects and scope of forensic medicine and medical Jurisprudence. Approaching the crime scene of death. Obtaining first hand information from the caller. Rendering medical assistance to the victim, if alive. Protecting life. Recording dying declaration. Identifying witnesses and, if possible, suspect. Interviewing onlookers and segregating possible witnesses. Recording of Medical experts evidence in courts.

Unit 2: Definition, Types and Classification: Injuries

15 Hours

Injuries: Definition, types and classification, Mechanism of injury, types of injuries: abrasions, bruises, lacerations, incised wounds, stab wounds, firearm injuries, defence wounds, self-inflicted wounds, injury patterns, medico legal aspects of injuries, ante-mortem, and post-mortem injuries, aging of injury, artificial injury; Thermal Injuries-burns, dowry deaths, scalds, electricity, lightning, explosions.

Unit 3: Death Investigation

15 Hours

Death Investigation: cause, manner, and mechanism of death: asphyxial deaths: hanging, ligature strangulation, throttling, suffocation, drowning, death from starvation, cold and heat, anaphylactic deaths. Sign of Death, cessation of vital functions, changes in the Eye & Skin, cooling of body, post-mortem lividity, cadaveric changes in the muscles, putrefaction, adipocere & mummification. Estimation of time since Death. Examination of decomposed and mutilated bodies. Exhumation. Investigation of asphyxial death, Death due to drowning, Thermal deaths, dowry deaths.

Unit 4: Introduction to Forensic Dentistry

15 Hours

Introduction to forensic dentistry. Dental postmortem procedures and record analysis. Age estimation in children and adults. Identification in mass disasters and incinerated remains. Postmortem changes to oral structures. Bite mark evidence: collection, preservation, analysis, comparison, and legal aspects. Human vs. animal bite marks. Principles of forensic odontology report writing.

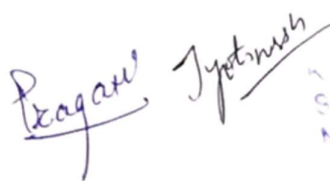

Suggested Readings:

1. K. Smyth, *The Cause of Death*, Van Nostrand and Company, New York (1982).
2. M. Bernstein, *Forensic odontology in, Introduction to Forensic Sciences*, 2nd Ed., W. G. Eckert (Ed.), CRC Press, Boca Raton (1997).
3. J. Dix, *Handbook for Death Scene Investigations*, CRC Press, Boca Raton (1999).
4. H. B. Baldwin and C. P. Mayin, *Encyclopaedia in Forensic Science*, Volume 1, J. A. Siegel, P.J. Saukko and G.C. Knupfer (Eds.), Academic Press, London (2000).
5. T. Beveland R. M. Gardner, *Bloodstain Pattern Analysis*, 3rd Edition, CRC Press, Boca Raton (2008).

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Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar
Formative Assessment

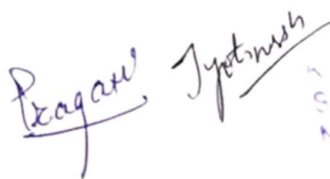
S. No.	Assessment Occasion	Weightage in	
1.	Attendance	05	
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total		30	



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Formative Assessment

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Total			30



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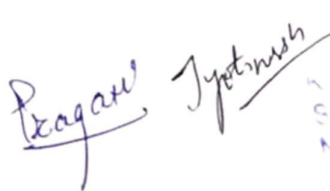
3. Kittel, C. (2018). *Introduction to solid state physics (9th ed., Global ed.)*. Wiley.
4. Krane, K. S. (1987). *Introductory nuclear physics (3rd ed.)*. Wiley.
5. Banwell, C. N., & McCash, E. M. (1994). *Fundamentals of molecular spectroscopy (4th ed.)*. McGraw-Hill.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

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Total		30

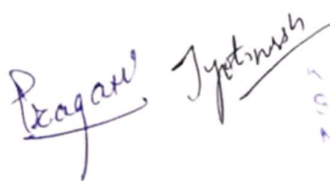



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Formative Assessment

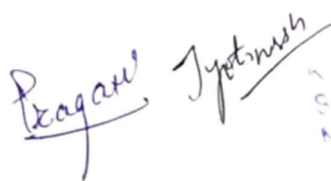

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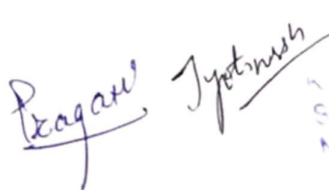
4. Inman, K., & Rudin, N. (2001). *Principles and practice of criminalistics: The profession of forensic science*. CRC Press.
5. Balding, D. J., Bishop, M., & Cannings, C. (2008). *Handbook of statistical genetics (3rd ed.)*. Wiley.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

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B. Sc. Forensic Science
Semester V
Practical 5

Credits: 3 Hours: 90

Course Title: Practical 5	Course Code: BSFS-506P
Course Type: Practical, L-T-P: 0-0-6	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able:

1. To identify injuries, post-mortem changes, and poisoning cases in forensic analysis.
2. To apply tests and methods for detection of poisons and narcotics.
3. To verify concepts of spectroscopy, semiconductors, and radiation.
4. To perform chemical experiments on reactions, titrations, extractions, and analysis.
5. To use molecular biology tools like PCR, electrophoresis, ELISA, and DNA typing.
6. To evaluate DNA evidence reliability and limitations in forensic investigations.

Credits: 3

Hours: 60

Forensic Medicine Lab

1. To identify and describe the different types of injuries (abrasion, bruise, laceration, incised wound) using photographs
2. Demonstration of post-mortem changes (livor mortis, rigor mortis) using case photographs.
3. Examination of asphyxia deaths (hanging, strangulation, drowning) through case studies/photographs.
4. Study of putrefaction, adipocere, and mummification through preserved specimens/images.
5. Recording dental charts for age estimation and identification.

Forensic Toxicology Lab

1. Preparation of an analysis plan for different poisoning cases (acid poisoning, drug overdose, pesticide poisoning).
2. To identify metallic poisons.
3. To perform Spot tests for common narcotics drugs.
4. To demonstrate the methods used for detecting inorganic poisons
5. Morphological identification of poisonous plant parts (seeds, fruits, roots).

General Physics-V

1. Determination of electron charge-to-mass ratio (e/m) using Thomson's method.
2. To study the relation between wavelength and color using a prism spectrometer.
3. To determine the band gap of a semiconductor using diode method.
4. To verify Ohm's law using a simple circuit
5. To determine the absorption coefficient of gamma rays in lead.

General Chemistry-V

1. To Compare SN1 vs SN2 using tertiary vs primary alkyl halides ($\text{AgNO}_3/\text{ethanol}$ and $\text{NaI}/\text{acetone}$ tests).
2. To Extract caffeine from tea/coffee and confirm by TLC.
3. To carry out the Phosphate estimation in fertilizer by colorimetry (molybdenum blue method).
4. Acid-base titration: standardize NaOH with oxalic acid and find unknown HCl strength.
5. To carry out electrophilic aromatic substitution: nitration of acetanilide and confirm by melting point.

General Biology V

1. To perform Agarose Gel Electrophoresis to separate DNA fragments (demo/visualization).
2. To demonstrate ELISA technique for antigen detection.
3. To perform Gram staining of bacteria and observation under microscope
4. To isolate and culture microorganisms from soil or water samples.

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5. To compare precipitation vs agglutination using simple antigen–antibody systems

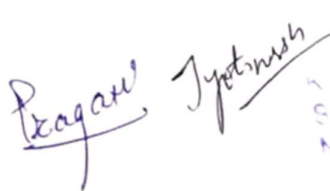
DNA Fingerprinting Lab

- 1. To extract DNA from biological samples and assess its quality.
- 2. To perform Amplification of DNA by Polymerase Chain Reaction (PCR)
- 3. To perform DNA fingerprinting using agarose gel electrophoresis.
- 4. To extract RNA from the given biological samples
- 5. To prepare a report on the role of DNA typing in solving paternity disputes

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

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**B. Sc. Forensic Science
Semester-VI
Forensic Ballistics**

Credits: 4

Hours: 60

Course Title: Forensic Ballistics	Course Code: BSFS-601
Course Type: Major Theory, L-T-P:4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able:

1. To understand firearm types, components, and legal aspects.
2. To classify ammunition and study ballistic dynamics.
3. To analyze gunshot injuries and residues for forensic use.
4. To examine firearms and ammunition for identification and linkage.
5. To prepare ballistic reports, ensure chain of custody, and interpret case studies.
6. To evaluate ballistic evidence for accuracy and relevance in investigations.

Credits: 4

Hours: 60

Unit 1: Fundamentals of Forensic Ballistics and Firearms

15 Hours

Introduction to forensic ballistics, its scope, and role in criminal investigations. Historical development and types of ballistics: internal, external, terminal, and wound ballistics. Basic classification of firearms, including rifled and smooth-bore, country-made and improvised weapons. Structure and functioning of common firearms such as pistols, revolvers, rifles, shotguns, and automatic or semi-automatic weapons. Key firearm components include barrels, firing mechanisms, safeties, and magazines. Concepts of rifling, calibre, gauge, and manufacturing marks. Legal definitions and provisions under the Arms Act and Explosives Act relevant to firearms and ammunition.

Unit 2: Ammunition, Ballistic Dynamics, and Effects on Targets

15 Hours

Construction and classification of ammunition based on design and function. Functional parts of cartridges, types of projectiles, primers, priming compounds, and headstamp markings. Cartridge firing mechanism and the types of marks produced during firing, including firing pin, breech face, chamber, extractor, and ejector marks. Basic principles of internal and external ballistics, including ignition of propellants, pressure, recoil, vacuum trajectory, air resistance, yaw, drag, projectile stability, and ricochet. Study of trajectory, heat, and pressure effects, and the influence of projectile shape, velocity, and angle of impact on the target.

Unit 3: Terminal Ballistics, Wound Analysis, and Gunshot Residue

15 Hours

Study of terminal and wound ballistics concerning the interaction of projectiles with human tissue. Nature and features of entry and exit wounds caused by different firearms, such as shotguns, rifles, handguns, and country-made weapons. Factors affecting wound patterns and differentiation between postmortem and antemortem firearm injuries. Analysis of gunshot residue (GSR), including its formation, location, and collection methods. Techniques used for GSR analysis, such as chemical tests and instrumental methods, and their use in shooter identification. Evaluation of firearm injuries through real or mock case examples.

Unit 4: Examination, Legal Aspects, and Reporting in Ballistics

15 Hours

Principles and procedures for the identification and examination of firearms, ammunition, and fired components. Class and individual characteristics observed on bullets and cartridge cases for firearm linkage. Handling, documentation, and examination of ballistic exhibits. Legal framework including relevant sections of the Arms Act, Explosives Act, and IPC about firearms and ammunition. Role and duties of a ballistic expert during investigation and court proceedings. Structure and preparation of ballistic reports, maintaining chain of custody, and ethical issues. Study of case laws involving firearms, accidental discharges, self-defence claims, and reconstruction of firearm-related crime scenes.

Suggested Readings:

1. Heard, B. J. (2022). *Handbook of Firearms and Ballistics: Examining and Interpreting Forensic Evidence (3rd Edition)*. Wiley.

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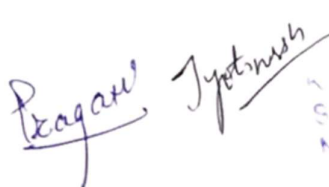
2. Haag, M. G., & Haag, L. C. (2023). *Shooting Incident Reconstruction (3rd Edition)*. Academic Press.
3. Nichols, R. (2021). *Firearm and Toolmark Identification: The Scientific Reliability of the Forensic Science Discipline*. CRC Press.
4. Grzybowski, R., Miller, J., & Moran, B. (2022). *AFTE Theory of Identification and Range of Conclusions for Toolmark Identification*. *Association of Firearm and Tool Mark Examiners Journal*.
5. Di Maio, V. J. M. (2021). *Gunshot Wounds: Practical Aspects of Firearms, Ballistics, and Forensic Techniques (4th Edition)*. CRC Press.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
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Total			30



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**B. Sc. Forensic Science
Semester-VI
Forensic Anthropology
Hours: 60**

Credits: 4

Course Title: Forensic Anthropology	Course Code: BSFS-602
Course Type: Major Theory, L-T-P:4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course the student should be able:

1. To understand the principles of forensic anthropology, bone biology, and taphonomic processes.
2. To apply anthropometric techniques to estimate age, sex, ancestry, and stature from skeletal remains.
3. To perform facial reconstruction and follow DVI protocols in mass disaster scenarios.
4. To use modern technologies and interdisciplinary tools in forensic anthropology.
5. To recognize ethical, legal, and cultural considerations in handling human remains.
6. To analyze skeletal evidence to support forensic investigations and case reconstruction.

Credits: 4

Hours: 60

Unit 1: Introduction to Forensic Anthropology and Human Osteology

15 Hours

Introduction to Anthropology and forensic anthropology; Branches of anthropology; Responsibilities and ethical considerations of forensic anthropologists; Handling, documentation, and recovery of skeletal remains; Chain of custody and preservation of evidence; Introduction to forensic taphonomy and stages of decomposition. Human skeletal system; Bone structure, types, composition, and development (ossification); Identification of major human bones; Morphological and histological differentiation of human vs animal bones; Taphonomic changes and their impact on skeletal analysis.

Unit 2: Anthropometric Methods and Estimation of Biological Profile

15 Hours

Somatometry; Somatometry; Different Tools; Craniometric and post-cranial landmarks; Data collection and application in forensic profiling. Sex estimation and determination; Age estimation; Race/Ancestry estimation; Stature estimation; Limitations and accuracy.

Unit 3: Facial Reconstruction, Mass Disasters and Disaster Victim Identification

15 Hours

Overview of forensic facial approximation; Manual vs digital facial reconstruction techniques; Tissue depth markers and anatomical facial landmarks; Facial reconstruction process; Facial superimposition; Genetic and congenital anomalies; Challenges and limitations of facial reconstruction; Forensic applications and notable case studies. Types and impact of mass disasters; Role of forensic anthropologists in disaster response; DVI protocols; Examination and identification of dead bodies in mass disasters; Mutilated bodies; Case studies; Ethical and cultural considerations in DVI; Role of teeth in mass disaster identification.

Unit 4: Advances, Ethics, and Legal Aspects in Forensic Anthropology

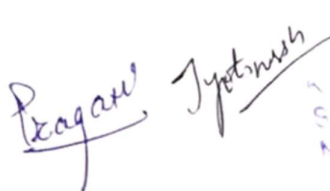
15 Hours

Advances in 3D imaging, CT and MRI applications; Use of artificial intelligence and machine learning in skeletal analysis; Integration with forensic genomics and proteomics; Virtual anthropology and digital reconstruction; Emerging techniques in age and ancestry estimation; Humanitarian forensics and global DVI efforts. Ethical guidelines for handling human remains; Cultural sensitivity and human rights; Informed consent, repatriation, and handling of indigenous remains; Legal admissibility of forensic anthropology evidence; Role of forensic anthropologist as expert witness; Report writing; Standards in forensic documentation.

Suggested Readings:

1. Ubelaker, D. H. (2020). *Forensic Science: Current Issues, Future Directions*. Wiley.
2. Steadman, D. W. (2021). *Hard Evidence: Case Studies in Forensic Anthropology [3rd Edition]*. Routledge.



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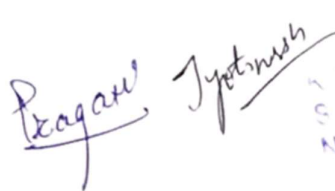
3. Langley, N. R., & Jantz, R. L. (2022). *Atlas of Human Cranial Macromorphoscopic Traits*. Academic Press.
4. Rathbun, T. A., & Buikstra, J. E. (2022). *Human Identification: Case Studies in Forensic Anthropology*. Routledge.
5. Ferllini, R. (Ed.). (2021). *Forensic Anthropology and the United Nations: Human Rights and Human Identification*. Cambridge University Press.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

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Total			30



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B. Sc. Forensic Science
Semester-VI
Digital Forensics

Credits: 4 Hours: 60

Course Title: Digital Forensics	Course Code: BSFS-603
Course Type: Major Theory, L-T-P: 4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): After successful completion of the course, the student will be able:

1. To remember the basics of computer science in daily life.
2. To understand computer networks, internet protocols, and types of computer crimes.
3. To explain the link between forensic science, cyberspace, and digital evidence.
4. To analyze the IT Act and related laws on privacy, piracy, and data protection.
5. To apply digital forensic tools and techniques to investigate cybercrimes.
6. To evaluate digital evidence for admissibility and reliability in legal proceedings

Credits: 4 Hours: 60

Unit 1: Number systems and Computer fundamentals

15 Hours

Introduction to Binary, Octal, Decimal and Hexadecimal Number Systems; Conversion from Binary to Decimal, Decimal to Binary, ASCII and UTF. Introduction, History and Classification of Computers. Hardware and accessories-development of hard disk, physical construction, CHS and LBA addressing, encoding methods and formats, of Computers. Fundamental Block diagram of Computer: CPU, Input and Output Unit. Various Input & output Devices, Memory Devices. Organizing a Computer System, Software, Storage Devices; Basics of Operating System, Windows and Linux. Introduction to File systems, Introduction and Applications of Information and Communications Technology (ICT).

Unit 2: Basics of Computer Networking & Internet

15 Hours

Definition of Computer Network, Components of Network, Topology and Types of network, Introduction to OSI layer and TCP / IP protocol suite, Communication Devices, Search Engines. E-Commerce and security, key IP and MAC Addresses, Understanding Internet, Introduction to websites and web pages; understanding Firewall, IDS and IPS; Introduction to Network and Internet Related Crimes. Encryption and digital signature, and authentication Emerging trends, Internet telephony, virtual reality over the web, etc. Intranet and extranet, firewall.

Unit 3: Computer Crimes

15 Hours

Definition and types of computer crimes. Distinction between computer crimes and conventional crimes. Reasons for commission of computer crimes. Breaching security and operation of digital systems. Computer virus, and computer worm – Trojan horse, trap door, super zapping, logic bombs. Types of computer crimes – computer stalking, pornography, hacking, crimes related to intellectual property rights, computer terrorism, hate speech, private and national security in 62 cyber space. An overview of hacking, spamming, phishing and stalking.

Unit 4: Digital Forensics & Evidence Management

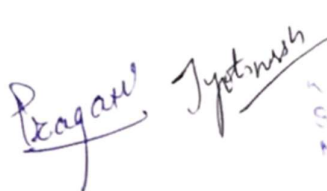
15 Hours

Digital Forensics – Introduction, Objective, Methodology, Rules and Services of Digital Forensics, various branches of digital forensics - Live Forensics, Disk Forensics, Network Forensics, Mobile Device Forensics etc. Seizure of suspected computer. Preparation required prior to seizure. Protocols to be taken at the scene. Extraction of information from the hard disk. Treatment of exhibits. Creating bitstream of the original media. Collection and seizure of magnetic media. Legal and privacy issues. Examining forensically sterile media. Restoration of deleted files. Encryption and decryption methods, Security : symmetric and asymmetric key.

Suggested Readings:

1. *Operating Systems | Internals and Design Principles, Ninth Edition by William Stallings*



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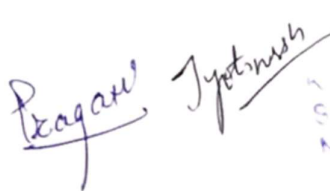
2. *Modern Operating Systems 4e* by Tanenbaum
3. *Computer Networks: A Top - Down Approach* by FOROUZAN
4. *TCP/IP Protocol Suite E/4* by Behrouz A. Forouzan
5. Nina Godbole and SunitBelapore, "Cyber Security: Understanding Cyber-crimes, Computer Forensics and Legal Perspectives", Wiley Publications, 2011.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

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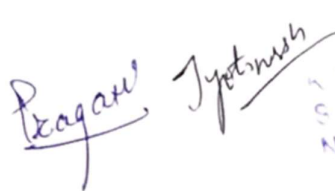
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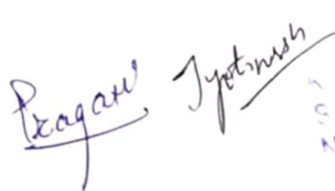
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	Mid semester test	15
Total		30



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		Mid semester test	15
		Total	30



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B. Sc. Forensic Science
Semester-VI
Forensic Entomology & Wildlife Forensics

Credits: 3 Hours: 45

Course Title: Forensic Entomology & Wildlife Forensics	Course Code: BSFS-605
Course Type: Minor Theory; L-T-P:3-0-0	Course Credits: 3
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): *At the end of the course, the student should be able:*

1. *To explain the principles, scope, and applications of forensic entomology and wildlife forensics.*
2. *To collect, preserve, and analyze insect and wildlife evidence using appropriate methods.*
3. *To identify insect species and wildlife materials involved in forensic investigations.*
4. *To apply national and international legal frameworks for wildlife protection and ethical evidence handling.*
5. *To prepare professional reports based on entomological and wildlife forensic findings.*
6. *To evaluate forensic entomology and wildlife evidence for reliability and case relevance.*

Credits: 3 Hours: 45

Unit 1: Forensic Entomology

12 Hours

Introduction to forensic entomology: history, scope, and importance, Types of forensic entomology: medico-legal, urban, and stored-product entomology, Insect succession on decomposing bodies, Life cycles of primary forensic insects (blowflies, flesh flies, beetles), Methods of insect collection from crime scenes and corpses, Preservation and documentation of entomological evidence, Estimation of postmortem interval (PMI) using insect development stages, Factors affecting insect activity: temperature, humidity, location, drug effect (Entomotoxicology), Role of forensic entomology in mass disasters and buried/remains cases.

Unit 2: Wildlife Forensics – Identification

11 Hours

Introduction to wildlife forensics: scope and significance, Common wildlife crimes in India: poaching, illegal trade, trafficking, Identification of wildlife evidence: hair, feathers, bones, skin, tusks, antlers, claws, etc., Taxonomic identification methods and morphological analysis, Forensic techniques: DNA barcoding, isotope analysis, bite mark analysis in animal attacks.

Unit 3: Wildlife Protection Laws

11 Hours

Wildlife protection laws: Wildlife Protection Act (1972), CITES Convention on International Trade in Endangered Species of Wild Fauna and Flora, Indian Forest Act (1927), Prevention of Cruelty to Animals Act, Role of Wildlife Crime Control Bureau (WCCB), TRAFFIC (Trade Records Analysis of Flora and Fauna in Commerce), WWF (World Wide Fund for Nature).

Unit 4: Investigative and Analytical Techniques in Entomology & Wildlife Forensics

11 Hours

Interdisciplinary approach: zoology, ecology, pathology, toxicology, Field collection techniques and scene documentation, Analytical methods: Microscopy (for eggs, hairs, feathers), DNA profiling in wildlife forensics, Entomo-toxicology – drug/toxin analysis in maggots, Chain of custody, legal submission of entomological/wildlife evidence, Ethics in wildlife and insect evidence collection

Suggested Readings:

1. *Byrd, J. H., & Castner, J. L. (2009). Forensic entomology: The utility of arthropods in legal investigations (2nd ed.). CRC Press.*
2. *Greenberg, B., & Kunich, J. C. (2002). Entomology and the law: Flies as forensic indicators. Cambridge University Press.*

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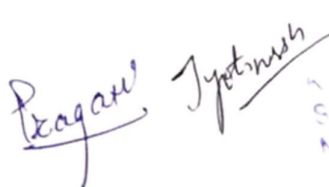
3. Goff, M. L. (2000). *A fly for the prosecution: How insect evidence helps solve crimes*. Harvard University Press.
4. Huffman, J. E., & Wallace, J. R. (2012). *Wildlife forensics: Methods and applications*. Wiley-Blackwell.
5. Elliott, R., & Wyatt, T. (2020). *Wildlife crime: An environmental criminology and crime science perspective*. Routledge.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

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**B. Sc. Forensic Science
Semester-VI
Practical 6**

Credits: 2 Hours: 60

Course Title: Practical 6	Course Code: BSFS-606P
Course Type: Practical, L-T-P: 0-0-4	Course Credits: 2
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): *At the end of the course the student should be able:*

1. *To analyze firearms, ammunition, gunshot patterns, and wounds.*
2. *To study bones and teeth to estimate sex, age, and stature.*
3. *To perform anthropometric assessments for identification.*
4. *To collect, preserve, and analyze digital evidence.*
5. *To apply tools for data acquisition, digital security, and networking.*
6. *To prepare forensic reports and present expert testimony in court.*

Credits: 2 Hours: 60

Forensic Ballistics Lab.

1. To identify and demonstrate different types of firearms(pistols, revolvers, rifles, shotguns, improvised/country-made weapons).
2. To handle, package, and document firearm exhibits properly.
3. To compare bullets and cartridge cases using a comparison microscope.
4. To differentiate close-range, intermediate-range, and long-distance gunshot patterns.
5. To examine entry and exit wound patterns using pictures.

Forensic Anthropology Lab.

1. To identify and label the major bones of the human skeleton.
2. To perform somatoscopic and somatometric assessments using standard tools (e.g., calipers, osteometric board, anthropometer).
3. To estimate sex, age, and stature of skeletal remains using morphological traits and regression formulas.
4. To estimate sex from skull and pelvic features.
5. To study dental charting and teeth morphology for victim identification in mass disaster scenarios.

Digital Forensics Lab.

1. To identify, seize and preserve digital evidence from crime scenes.
2. To acquire data from PCs/laptops/HDDs/USBs, pen drives, memory cards and SIM cards.
3. To use digital signatures for securing e-mail and online transactions.
4. To compare the basic features of Windows and Linux operating systems.
5. To study and configure communication devices such as switches, routers, and hubs.

Forensic Entomology and Wildlife forensics

- a. To identify wildlife hairs and furs under a comparison microscope.
2. To identify species (tiger, leopard, dog, etc.) based on pug mark patterns.
3. To prepare a wildlife forensic case report from given seized material.
4. To collect and preserve insect evidence from a simulated crime scene
5. To identify forensically important insects using morphological keys and study their developmental stages for forensic applications.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

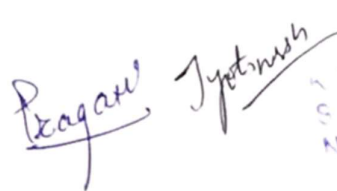
Formative Assessment

S. No.	Assessment Occasion	Weightage in
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1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



V Subharti College of Science
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YEAR IV

SWAMI VIVEKANAD SUBHARTI UNIVERSITY MEERUT													
KERAL VERMA SUBHARTI COLLEGE OF SCIENCE													
Department of Forensic Science													
Course Name - B.Sc. Forensic Science													
Batch:2025-26				SEM:VII									
S.No.	Course Type	Course Code	Course	Teaching Load			Credits	Attendance (5)	Internal Assessment		External Assessment	Total	Remark
				L	T	P			quiz/ PPT/ Assignment (10)	Mid Sem Test (15)			
THEORY and PRACTICAL SUBJECTS													
1	Major 15	BSFS-701	Research Methodology	4	0	0	4	5	10	15	70	100	
2	Major 16	BSFS-702	Total Quality Management (TQM)	4	0	0	4	5	10	15	70	100	
3	Major 17	BSFS-703	Advanced Physical and Chemical Techniques	4	0	0	4	5	10	15	70	100	
4	Minor 9	BSFS-704	NDPS Act	4	0	0	4	5	10	15	70	100	
5	Practical 7 (Based on Major (15+16))	BSFS-705P	Based on Major (15+16)	0	0	4	2	5	10	15	70	100	
6	Practical 8 (Based on Major 17+ Minor 9)	BSFS-706P	Based on Major 17+ Minor 9	0	0	4	2	5	10	15	70	100	
TOTAL CREDITS / ASSESSMENT							20	30	60	90	420	600	

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SWAMI VIVEKANAD SUBHARTI UNIVERSITY MEERUT													
KERAL VERMA SUBHARTI COLLEGE OF SCIENCE													
Department of Forensic Science													
Course Name - B.Sc. Forensic Science													
Batch:2025-26				SEM:VIII									
S.No.	Course Type	Course Code	Course	Teaching Load			CREDITS	Internal Assessment			External Assessment	Total	Remark
				L	T	P		Attendance (5)	Quiz/PPT/Assignment (10)	Mid Sem Test (15)	End Sem Exam (70)		
THEORY and PRACTICAL SUBJECTS				L	T	P							
1	Major 18	BSFS-801	Advanced Biological & Serological Techniques	4	0	0	4	5	10	15	70	100	
2	Minor 10	BSFS-802	Cyber Forensics	4	0	0	4	5	10	15	70	100	
3	Research Project / Dissertation	BSFS-803R		0	0	24	12	5	10	15	70	100	
TOTAL CREDITS / ASSESSMENT							20	15	30	45	210	300	

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**B. Sc. Forensic Science
Semester-VII
Research Methodology**

Credits: 4

Hours: 60

Course Title: Research Methodology	Course Code: BSFS-701
Course Type: Major Theory, L-T-P:4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes: On successful completion of this course, students will be able:

1. To conduct comprehensive literature reviews to inform and support research.
2. To develop and execute detailed research plans and designs.
3. To apply appropriate data collection methods and analyze data using statistical tools.
4. To write structured and well-documented research papers and theses.
5. To understand and address ethical issues, intellectual property rights, and copyright in research.
6. To present research findings effectively through seminars, conferences, and publications.

Credits: 4

Hours: 60

Unit 1: Objectives and types of research

15 Hours

Objectives and types of research: Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, and Conceptual vs. Empirical; Research Formulation: Literature review and development of hypothesis; Research design and methods: Developing a research plan-Exploration, Description, Diagnosis, and Experimentation; Determining experimental and sample designs.

Unit 2: Data Analysis Methods

15 Hours

Data Collection and Analysis: Methods of data collection – Sampling methods and data processing; Data Analysis: Types of data, Basic concept of frequency distribution, Measure of central values – Mean, median, and mode, Measure of dispersion, Range, mean deviation and standard deviation, Probability theory and classical definition of probability, Bayes theorem of probability, Conditional probability and coincidence probability; Statistical Analysis: Chi-square test, ANOVA, SPSS; Types of Errors and Interpretation of Findings.

Unit 3: Scientific Reports and Thesis Writing

15 Hours

Reporting and thesis writing: Structure and components of scientific reports and thesis; Significance and different steps in the preparation; Illustrations, Bibliography; Presentations: Oral and Poster; Importance of effective communication in scientific research.

Unit 4: Ethical Issues and Intellectual Property Rights

15 Hours

Basics of ethical issues in research; Understanding intellectual property rights and copyright; Ethical standards and practices in research; Plagiarism and how to avoid it; Legal aspects of research and intellectual property. Checklist for avoiding predatory/fake journals; steps for publishing an article in a peer-reviewed journal. Concept of impact factor, i-10 index, H-index.

Suggested Readings:

1. *Research Methodology: Methods and Techniques* by C.R. Kothari, Gaurav Garg, New Age International Publishers.

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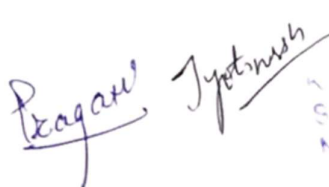
2. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* by John W. Creswell, J. David Creswell, SAGE Publications.
3. *Practical Research: Planning and Design* by Paul D. Leedy, Jeanne Ellis Ormrod,
4. *Research Methods: the concise knowledge base* by Trochim, W.M.K., 2005;
5. *Research Methods: A Process of Inquiry*, Allyn and Bacon by Anthony, M., Graziano, A.M. and Raulin, M.L., 2009.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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**B. Sc. Forensic Science
Semester-VII
Total Quality Management**

Credits: 4

Hours: 60

Course Title: Total Quality Management	Course Code: BSFS-702
Course Type: Major Theory; L-T-P:4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able:

1. To understand TQM principles and their role in forensic labs.
2. To apply QA/QC measures in line with ISO/IEC standards.
3. To use tools and statistics to evaluate processes and control errors.
4. To examine accreditation requirements and audit mechanisms.
5. To develop ethical, accurate, and defensible forensic reports.
6. To implement SOPs to ensure consistency and reliability.

Credits: 4

Hours: 60

Unit 1: Introduction to Quality Management in Forensic Science

15 Hours

Definition, scope, and significance of Total Quality Management (TQM) in forensic laboratories; evolution and principles of TQM; differences between quality assurance and quality control; structure and role of Quality Management Systems (QMS) with reference to ISO 9001 and ISO/IEC 17025; essential components of a forensic QMS including qualified personnel, standard procedures, calibrated equipment, and controlled documentation; development of quality policies, quality culture, and the role of leadership in ensuring accuracy, reliability, and accountability in forensic reporting; overview of national and international accreditation bodies such as NABL, ILAC, and ASCLD-LAB.

Unit 2: Quality Standards, Accreditation, and Auditing

15 Hours

Overview of ISO/IEC 17025:2017 requirements for testing and calibration laboratories and ISO/IEC 17020 for inspection bodies; implementation of Good Laboratory Practices (GLP) in forensic science; significance of SOPs, method validation, calibration, measurement uncertainty, and traceability; process of NABL accreditation and compliance mechanisms; understanding the chain of custody and ensuring evidence integrity; types of audits—internal, external, and third-party—with emphasis on planning, checklist preparation, audit findings, reporting, and corrective and preventive actions (CAPA); proficiency testing, inter-laboratory comparisons, and version-controlled documentation review.

Unit 3: Quality Tools, Statistical Techniques, and Error Management

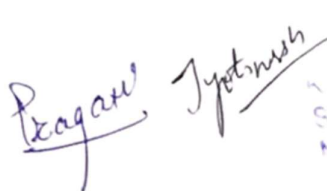
15 Hours

Introduction to quality control tools including control charts, flowcharts, checklists, histograms, Pareto analysis, and cause-effect diagrams; root cause analysis (RCA), CAPA, and non-conformance management in forensic processes; documentation control and deviation reporting; statistical quality control (SQC) and its application in forensic analysis; overview of Six Sigma, Lean, and PDCA cycle as improvement tools; calibration and validation protocols for instruments and analytical methods to ensure consistency and accuracy in laboratory outcomes.

Unit 4: Quality Assurance in Forensic Practice, Ethics, and Continuous Improvement

15 Hours

Application of TQM principles across forensic disciplines such as biology, chemistry, toxicology, digital forensics, and ballistics; error analysis, estimation of measurement uncertainty, and its impact on evidence interpretation; case studies highlighting quality failures and their consequences in real forensic casework; preparation of unbiased, clear, and valid expert reports; ethical conduct, professional integrity, and courtroom responsibilities of forensic experts; strategies for continuous improvement through feedback systems, client



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satisfaction, staff competence assessment, and management reviews; sustaining quality through training, benchmarking, and regular audits.

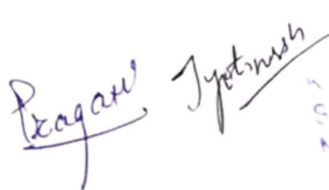
Suggested Readings:

1. Kumar, A., & Singh, D. (2023). *Quality Management in Forensic Science Laboratories*. Springer.
2. Griffiths, A. (2022). *ISO/IEC 17025:2017 – A Practical Guide for Forensic Laboratories*. BSI Standards.
3. Houck, M. M. (2023). *Professional Issues in Forensic Science (2nd Edition)*. Academic Press.
4. Amendt, J. (2022). *Best Practices in Quality Assurance and Quality Control in Forensic Entomology*. Springer.
5. Kourti, T. (2023). *Statistical Process Control for Forensic Laboratory Quality Assurance*. Wiley.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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B. Sc. Forensic Science
Semester-VII
Advanced Physical And Chemical Techniques

Credits: 4

Hours: 60

Course Title: Advanced Physical and Chemical Techniques	Course Code: BSFS-703
Course Type: Major Theory, L-T-P: 4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (CO): After successful completion of the course, the student will be able:

1. To analyse atomic and molecular spectra, electromagnetic spectrum, and detector types.
2. To understand principles and forensic uses of UV-Vis, IR, and FTIR spectroscopy.
3. To apply chromatographic techniques (TLC, HPLC, GC, HPTLC) in forensic analysis.
4. To evaluate spectrophotometric methods including AAS, AES, ICP, X-ray, Auger, and mass spectrometry.
5. To develop skills to select appropriate spectroscopic or chromatographic methods for evidence analysis.
6. To integrate spectroscopy and chromatography data to interpret forensic results.

Credits: 4

Hours: 60

Unit 1: Spectroscopic Techniques

15 Hours

UV-Visible spectroscopy: Theory, Instrumentation and Applications; Infrared Spectroscopy: Molecular vibration, Theory of IR absorption, IR Sources and Instrumentation, FT-IR Applications; Raman Spectroscopy: Theory of Raman spectroscopy, Instrumentation and Applications. Differences & Similarities between Raman & IR spectroscopy. FT-NIR spectroscopy: Theory, Instrumentation & Applications, Neutron Magnetic Resonance: Theory, Instrumentation & Application, Mass Spectrometry: Theory, Instrumentation and Applications.

Unit 2: Chromatographic Techniques

15 Hours

Introduction to Chromatography: Partition, Adsorption, Ion exchange, Affinity Chromatography, Size Exclusion Chromatography, their principle and types of chromatography. Forensic applications of Chromatography. Gas Chromatography: Principle, instrumentation and applications. Gas-liquid and gas-solid chromatography, GC – MS, GC – MS – MS (Tandem). Gas Chromatography – Head Space: Principle, instrumentation and applications. High Performance Liquid Chromatography: Principle, instrumentation and applications, LC – MS, LC – MS – MS (Tandem).

Unit 3: Instruments for Elemental Analysis

15 Hours

Atomic Absorption Spectroscopy: Theory, Instrumentation and Applications. Atomic Emission Spectroscopy: Theory, Instrumentation and Applications. ICP-OES: Theory, Instrumentation and Applications. ICP-MS: Theory, Instrumentation and Applications. X- Ray Spectroscopy: Theory, Types, Instrumentation and Applications. EDXRF: Theory, Instrumentation and Applications.

Unit 4: Forensic applications of Instrumental Analysis

15 Hours

Drug Analysis: Illicit substances, pharmaceuticals, Toxicology: Poisons, alcohol, and drug metabolism, Explosives and Fire Debris Analysis, Environmental Forensics: Heavy metals, soil, water, and air pollution, Gunshot Residue & Tool Mark Analysis, Document Examination: Ink analysis, forgery detection), Interpretation of spectral/chromatographic data and Calibration and validation of forensic instruments.

Suggested Readings:

1. John C. Lindon, George E. Tranter & John L. Holmes; *Encyclopedia of Spectroscopy & Spectrometry*, Academic Press (2000)
2. Cottrell, C.T. Irish, D, Msters V M., and Steward, J.E. (1985) *Introduction to ultraviolet and visible spectrophotometry*, 2nd ed. Pye Unicam, Cambridge

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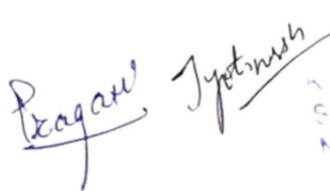
3. Burgess, C., and Knowle, A. (1981) *Technique in visible and Ultraviolet absorption spectroscopy*, Chappman and Hall, London
4. Claridge, T. D. W., *High-Resolution NMR Techniques in Organic Chemistry. A Practical Guide to Modern NMR for Chemists*, OUP, Oxford, 2000
5. Gunther, H., *NMR Spectroscopy. Basic Principles, Concepts and Applications in Chemistry*.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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B. Sc. Forensic Science
Semester-VII
Narcotic Drugs and Psychotropic Substances (NDPS) Act

Credits: 4

Hours: 60

Course Title: NDPS Act	Course Code: BSFS-704
Course Type: Minor Theory; L-T-P:4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course, the student should be able:

1. To understand the provisions, objectives, and key sections of the NDPS Act, 1985.
2. To apply forensic techniques for detection, identification, and profiling of drugs.
3. To analyze national and international drug control laws and enforcement mechanisms.
4. To evaluate challenges in drug trafficking, addiction, and their societal impact.
5. To assess advances in narcotics forensics and emerging legal and ethical issues.
6. To develop strategies for effective drug law enforcement and forensic investigation.

Credits: 4

Hours: 60

Unit 1: Introduction to NDPS Act, 1985

15 Hours

Historical Background and Objectives, Significance and scope; Definitions of narcotic drugs, psychotropic substances, and controlled substances (Section 2), Classification based on origin and effect; Major Provisions and Important Sections: Section 8, Section 9, Sections 15–20, Sections 21–23, Section 25, Section 27, Section 31A, Section 37; Amendments to the NDPS Act; Enforcement Agencies and Role of key enforcement bodies.

Unit 2: Investigation and Forensic Analysis of Drugs

15 Hours

Crime Scene Management, Presumptive Test, Confirmatory Tests; Illicit Drug Identification: Natural Drugs, Synthetic Drugs; Pharmaceutical Misuse; Drug Profiling & Signature Analysis.

Unit 3: National & International Drug Control Policies

15 Hours

NDPS Act, 1985 (Provisions, penalties, amendments), Prevention of Illicit Traffic in Narcotic Drugs and Psychotropic Substances Act (PITNDPS), 1988, Drugs & Cosmetics Act, 1940. International Conventions & Treaties; Role of UNODC, INTERPOL, INCB in drug control. Illicit Drug Trafficking. Drug addiction, rehabilitation, and de-addiction programs, Economic burden of drug abuse on society.

Unit 4: Challenges & Advances in Narcotics Forensics

15 hours

Designer drugs, synthetic opioids, new psychoactive substances (NPS); Analytical Challenges; Advances in Drug Detection: Field Testing Kits, Advanced Instrumentation, AI-based Drug Detection; Case Studies & Legal Challenges; Human rights issues and rehabilitation approaches.

Suggested Readings:

1. Rathod, C. (2021). *Drugs and Narcotics: The NDPS Act and Allied Laws (5th Edition)*. LexisNexis.
2. Pragst, F., & Balikova, M. A. (2020). *Analytical and Practical Aspects of Drug Testing in Human Biological Matrices*. Elsevier.
3. Basu, S., & Murthy, P. (2022). *Substance Use Disorders: A Clinical and Forensic Guide*. Springer.
4. Chakraborty, R. C. (2021). *Forensic Toxicology: Principles and Concepts*. Booksclinic Publishing.
5. Office of the Narcotics Control Bureau (India). (2022). *Annual Report 2021–22*. Ministry of Home Affairs, Government of India.

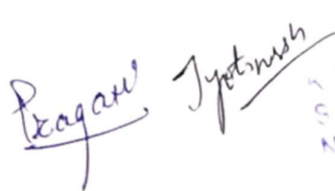
Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S. No.	Assessment Occasion	Weightage in
1.	Attendance	05

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2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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**B. Sc. Forensic Science
Semester VII
Practical 7**

Credits: 2 Hours: 60

Course Title: Practical 7	Course Code: BSFS-705P
Course Type: Practical, L-T-P: 0-0-4	Course Credits: 2
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course the student should be able:

1. To differentiate research types, methods, and sampling designs.
2. To conduct literature reviews, searches, and identify research gaps.
3. To apply basic statistical tools using manual and software methods.
4. To understand quality assurance, quality control, and management in forensic laboratories.
5. To prepare documentation and case studies on quality-related issues.
6. To evaluate research and quality processes to suggest improvements in forensic investigations.

Credits: 2

Hours: 60

Research Methodology Lab

1. To differentiate various types of research through case studies (Descriptive vs. Analytical, Applied vs. Fundamental, etc.).
2. To review research articles and summarize their objectives, type of research, and methodology.
3. To conduct a literature review using online databases (Google Scholar, PubMed, Scopus) and identify research gaps.
4. To calculate measures of central tendency (mean, median, mode) manually and using Excel/SPSS
5. To differentiate between sample designs (random, stratified, cluster) through examples.

Total Quality Management (TQM) Lab

1. To write a note on the importance of quality in forensic laboratories.
2. To list differences between Quality Assurance (QA) and Quality Control (QC).
3. To prepare a simple flowchart of a Quality Management System.
4. To prepare a basic chain of custody form for an evidence item.
5. To discuss one case study where poor quality affected forensic results.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30

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**B. Sc. Forensic Science
Semester VII
Practical 8**

Credits: 2

Hours: 60

Course Title: Practical 8	Course Code: BSFS-706P
Course Type: Practical, L-T-P: 0-0-4	Course Credits: 2
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course the student should be able:

1. To understand principles of UV-Vis, GC, HPLC, AAS, and NMR.
2. To apply chromatographic and spectroscopic methods in analysis.
3. To interpret key definitions and provisions of the NDPS Act.
4. To collect, package, and maintain chain of custody of drug evidence.
5. To detect and classify drugs using tests and field kits.
6. To prepare accurate forensic reports based on analytical and observational findings.

Credits: 2 Hours: 60

Advanced Physical and Chemical Techniques Lab

1. To study the working of a UV-Visible spectrophotometer
2. To study the instrumentation of gas chromatography (GC)
3. To demonstrate the principle of high-performance liquid chromatography (HPLC)
4. To study the principle and working of an Atomic Absorption Spectrophotometer (AAS).
5. To demonstrate the principle of NMR

NDPS Act Lab

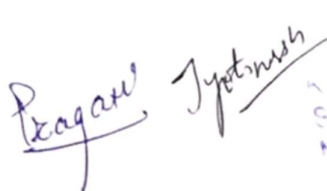
1. To study important definitions under Section 2 of the NDPS Act (drug, psychotropic substance, controlled substance).
2. To demonstrate proper collection, packaging, and chain of custody of drug evidence.
3. To perform presumptive color tests (Marquis, Duquenois-Levine, Scott's, Mandelin) for drug detection.
4. To identify and classify seized drugs as natural or synthetic using chemical/instrumental methods.
5. To demonstrate the use of rapid field drug testing kits.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S.No	Assessment Occasion	Weightage in
1.	Attendance	05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz
		Mid semester test
Total		30



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B. Sc. Forensic Science
Semester-VIII
Advanced Biological & Serological Techniques

Credits: 4

Hours: 60

Course Title: Advanced Biological & Serological Techniques	Course Code: BSFS-801
Course Type: Major Theory, L-T-P: 4-0-0	Course Credits: 4
Formative Assessment Marks: 25	Summative Assessment Marks: 70

Course Outcomes (COs): At the end of the course the student should be able to:

1. Analyse principles and applications of forensic microscopy.
2. Understand immunochemical techniques and immunoassays.
3. Apply electrophoretic methods to separate and identify biomolecules.
4. Evaluate molecular biology techniques (gene cloning, PCR, DNA sequencing) for forensic use.
5. Develop skills in selecting and integrating advanced biological methods.
6. Interpret and assess biological evidence to support investigations and legal processes.

Credits: 4

Hours: 60

Unit 1: Microscopy

15 Hours

Mirrors & Lenses, Basic principles of microscopy, Simple and Compound microscope, Study of different types of microscopes: Light Microscope & Electron Microscope: Comparison microscope, Phase contrast microscope, Stereoscopic microscope, Polarizing microscope, Fluorescence microscopy, IR microscopy, Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM).

Unit 2: Basics of Biological analytical techniques

15 Hours

Biological / Biochemical Analytical Techniques: Introduction to pH, Buffer systems and pH meter, Physiological solution, Theories of Precipitation, Coagulation, Sedimentation & Centrifugation, Different centrifugation techniques: Density Gradient Centrifugation, Differential Centrifugation & Preparative Centrifugation.

Unit 3: Basics of Electrophoresis

15 Hours

Fundamentals of Electrophoresis, Principles of electrophoretic techniques. Electrophoretic techniques: Zone electrophoresis (ZE), Paper electrophoresis (PE), Classical gel electrophoresis (CGE), Starch gel electrophoresis (SGE), Poly acrylamide gel electrophoresis (PAGE), SDS-PAGE, Isoelectric focusing (IEF) & Two dimensional SDS-PAGE.

Unit 4: Electromagnetic spectrum & separation techniques

15Hours

Electromagnetic Spectrum: Electromagnetic radiations, Absorption & Emission Spectra, General properties of electromagnetic radiations: Wave and Quantum mechanical properties, Atomic & molecular spectra, Florescence & Phosphorescence, Jablonski Diagram. Theoretical Concepts of Separation and Extraction techniques: Adsorption, Absorption & Partition, Partition co-efficient, Solvent extraction and Multiple extraction, Supercritical Fluid Extraction, Accelerated Solvent Extraction, Solid Phase Micro Extraction & Solid Phase Extraction, Plate theory and concept of theoretical plates with respect to peak width and peak intensity, Rate theory, Concept of Retention factor and Retention time.

Suggested Readings:

1. D.A.Skoog, F.J.Holler and T.A.Neman, Harcourt Principles of Instrumental Analysis college publishers, Singapore
2. Safferstein: Forensic Science Handbook Vol. I, II, III.
3. G.D.Christian and J.E.O'Reilly, Instrumental Analysis, Allyn and Bacon, Inc., Boston.
4. R.E.Smith, Supercritical Fluid Technology, C.R.C. Press, Inc., Boca Raton.

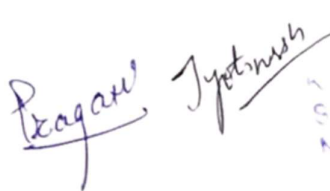
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5. S.Udenfriend, *Fluorescence Assay in Biology and Medicine*, Academic Press, New York.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

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1.	Attendance		05
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Total			30



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**B. Sc. Forensic Science
Semester-VIII
Cyber Forensics**

Credits: 4

Hours: 60

Course Title: Cyber Forensics	Course Code: BSFS-802
Course Type: Minor Theory, L-T-P: 4-0-0	Course Credits: 4
Formative Assessment Marks: 30	Summative Assessment Marks: 70

Course Outcome: After successful completion of the course, the student will be able:

1. To identify various types of cybercrimes and understand their impact on society.
2. To demonstrate proficiency in collecting, preserving, and analyzing digital evidence.
3. To apply forensic tools and techniques to investigate cybercrimes effectively.
4. To evaluate the role of cybersecurity measures in preventing and mitigating cyber threats.
5. To discuss ethical and legal considerations in cyber forensics and incident response.
6. To develop strategies to reconstruct digital incidents and present findings for legal and investigative purposes.

Credits: 4

Hours: 60

Unit 1: Introduction to Cybercrimes and Cyber Forensics

15 Hours

Basics: Definition, importance, role in law enforcement, Types of Cybercrimes: Hacking, phishing, deleted files, Mobile Forensics: Call logs, SMS, GPS tracking, Network Forensics: Monitoring online activities, tracking cybercrimes. Cyber Laws: Indian IT Act, 2000, Relevant IPC Sections, International Cyber Law identity theft, cyberstalking, online frauds. Types of Digital Forensics: Computer Forensics: Hard drives, CERT-IN and NCIIPC role in cyber security.

Unit 2: Digital Evidence Collection and Analysis

15 Hours

Digital Evidence: What it is and how to collect it, Handling & Preservation: Chain of custody, securing data. Forensic Tools: Disk Imaging & Recovery: Retrieving deleted files, Password Cracking: Unlocking secured data, Log Analysis: Tracking user activity, Hidden Data & Anti-Forensics: Steganography (hiding data in images, videos).

Unit 3: Cyber Threats & Network Security

15 Hours

Cyber Threats: Viruses, malware, ransom ware, phishing. Network Attacks & Defense: Detecting cyber intrusions (firewalls, antiviruses), Preventing unauthorized access (passwords, encryption). Email & Web Forensics: Investigating emails, websites, social media frauds, Dark Web & Cybercrime Investigations: Basics of the deep web, anonymous activities. threat intelligence and incident response MITRE ATT&CK, STIX AND TXII.

Unit 4: Challenges & Future Trends in Cyber Forensics

15 Hours

Challenges in Cyber Forensics: Encryption, privacy, rapid technological changes, Emerging Technologies: AI in cyber forensics, block chain tracking, crypto currency investigations, Ethical Issues: Privacy concerns, ethical hacking, legal responsibilities.

Suggested Readings:

1. Holt, T. J., Bossler, A. M., & Seigfried-Spellar, K. C. (2022). *Cybercrime and digital forensics: An introduction (3rd ed.)*. Routledge
2. Casey, E. (2012). *Digital evidence and computer crime: Forensic science, computers, and the internet (3rd ed.)*. Academic Press.
3. Gupta, B. B., & Dahiya, A. (2024). *Advancements in Cybercrime Investigation and Digital Forensics*. Apple Academic Press.

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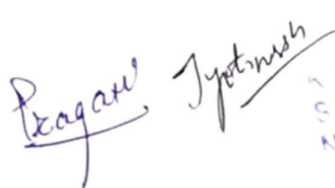
4. Bhardwaj, A., Singh, P., & Prasad, A. (2023). *Practical Digital Forensics: A Guide for Windows and Linux Users*. Bentham Science Publishers.
5. Sharma, N. (2017). *Cyber Forensics in India: A Legal Perspective*. LexisNexis.

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment

S. No.	Assessment Occasion		Weightage in
1.	Attendance		05
2.	Internal Assessment	Written Assignment/Presentation (PPT) /Quiz	10
		Mid semester test	15
Total			30



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