



INTEGRAL UNIVERSITY, LUCKNOW

INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES& RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

MASTER OF SCIENCE IN FORENSIC SCIENCE

(M. Sc. FS.)

SYLLABUS

YEAR/ SEMESTER: I/I



Integral University, Lucknow
Department of Paramedical Sciences
Study and Evaluation Scheme

Program:M.Sc.FS

Semester-I

S. N.	Coursecode	Course Title	TypeofPaper	PeriodPer hr./week/Sem			Evaluation Scheme				Subtotal	Credit	TotalCredits
				L	T	P	CT	TA	Total	ESE			
THEORIES													
1.	FS401	Crime Scene Investigation & Law	Core	3	1	0	40	20	60	40	100	3:1:0	4
2.	FS402	Forensic Photography	Core	2	1	0	40	20	60	40	100	2:1:0	3
3.	FS403	Biochemical & Analytical Techniques	Core	3	1	0	40	20	60	40	100	3:1:0	4
4.	FS404	Forensic Botany & Entomology	Core	3	1	0	40	20	60	40	100	3:1:0	4
5	FS405	Recent Advancement in Forensic Science	Core	2	1	0	40	20	60	40	100	2:1:0	3
PRACTICAL													
1.	FS406	Crime Scene Investigation & Law - LAB	Core	0	0	4	40	20	60	40	100	0:0:2	2
2.	FS407	Forensic Photography-LAB	Core	0	0	2	40	20	60	40	100	0:0:1	1
3.	FS408	Forensic Botany & Entomology-LAB	Core	0	0	4	40	20	60	40	100	0:0:2	2
4.	FS409	Seminars, Journal Club and Group Discussions	Core	0	2	0	50	50	100	00	100	0:0:2	2
Total				13	7	10	370	210	580	320	900	25	25

S. N.	Course code	Course Title	Typeof Paper	Attributes							United NationSustainableDeve lopmentGoal(SDGs)
				Employability	Entrepreneurship	SkillDev elopment	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
THEORIES											
1.	FS401	Crime Scene Investigation & Law	Core	√	√	√			√	√	3,4
2.	FS402	Forensic Photography	Core	√	√	√			√	√	3,4
3.	FS403	Biochemical & Analytical Techniques	Core	√	√	√			√	√	3,4
4.	FS404	Forensic Botany & Entomology	Core	√	√	√			√	√	3,4
5	FS405	Recent Advancement in Forensic Science	Core	√	√	√			√	√	3,4
PRACTICAL											
1.	FS406	Crime Scene Investigation & Law - LAB	Core	√	√	√			√	√	3,4
2.	FS407	Forensic Photography-LAB	Core	√	√	√			√	√	3,4
3.	FS408	Forensic Botany & Entomology-LAB	Core	√	√	√			√	√	3,4
4.	FS409	Seminars, Journal Club and Group Discussions	Core	√	√	√			√	√	3,4

L: Lecture **T:** Tutorials **P:** Practical **CT:**Class Test **TA:**Teacher Assessment **ESE:**EndSemester Examination,
AE: Ability enhancement, DSE-Discipline Specific Elective, **Sessional Total:**Class Test +Teacher Assessment **SubjectTotal:**SessionalTotal+EndSemesterExamination (ESE)



Integral University, Lucknow

Effective from Session: 2021-22

Effective from Session: 2021-22							
Course Code	FS401	Title of the Course	CRIME SCENE INVESTIGATION & LAW	L	T	P	C
Year	I	Semester	I	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The main objective of the subject is to develop the deep understanding about the crime, crime scene investigation and the investigative techniques.						
Course Outcomes							
CO1	To develop a deep understanding and knowledge of criminalistics and criminal investigation.						
CO2	To develop deep knowledge about the physical evidence and different investigative techniques.						
CO3	After studying this paper, the students will deeply understand the criminal justice system and its aspects in the field of forensic science.						
CO4	Students will have a deep understanding of the evaluation of evidence and writing of scientific reports.						
CO5	Students will have a core understanding of ethical behavior in the field of forensic science.						

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Basics of Forensic Science	Forensic Science – Introduction and definition, Basic Principles & Significance, History & Development of Forensic Science, Organizational Structure of Forensic Science laboratory. Crime Scene Investigation: - Definition & causation, crime scene, types of crime, processing of crime scene, protection and recording/documentation of crime scene (Note Taking, Videography, Photography and Sketching Methods), Blood spatter / Pattern analysis.	8	CO1
2	Physical Evidence	Physical Evidence: Meaning, Types, Searching Methods, Collection and Preservation, Forwarding, Chain of Custody. Collection, Preservation, Packing and Forwarding of: Blood, Semen, and Other Biological Stains, Firearm Exhibits, Documents, Fingerprints, Viscera, Hair & Fiber, Glass, Soil and Dust, Petroleum Products, Drugs, and Poisons, etc. Investigative Techniques: - Criminals, Criminal behavior, modus operandi, criminal profiling, Portrait-Parley, Polygraphy, Narco-analysis, Brain Fingerprinting, Voice stress analysis & speaker profiling.	8	CO2
3	Criminal Justice System	Criminal Justice System Criminal Justice System: - Structure of police, Prosecution & Judicial Organizations Introduction of BNS - various sections related to Homicidal cases and sexual assault, BNSS- FIR, Magistrate Inquest, Section 291, 292 & 293, BSA – Introduction and Sections 26(A), 32, 39, 45, 46, 47, 57, 58, 60, 73, 147, 148, 149 & 159. Explosive Act, Narcotic Act, NDPS Act and Cyber law, Drugs and Cosmetic Act, Excise Act, case study	8	CO3
4	Report Writing and Evidence Evaluation	Report Writing and Evidence Evaluation: - Components of reports and Report formants in respect of Crime Scene and Laboratory findings. Court Testimony- admissibility of expert testimony, per Court preparations & Court appearance, Examination in chief, cross-examination, and re-examination, Ethics in Forensic Science.	8	CO4
5	Forensic Ethics	Forensic Ethics: Introduction, Definition, Scope, Ethics in Forensic Science, Professionalism and ethics: Importance of professional ethics, the importance of professional ethics to science practitioners, development of code of conduct and code of ethics for Forensic Science; Application of codes and ethics, how ethical requirements impact the daily work of a forensic scientist; Ethical dilemmas and their resolution.	8	CO5

Reference Books:

1. Vipa P. Sarthi, Law of Evidence, 6th Edition, Eastern Book Co., Lucknow (2006).
2. A.S. Pillai, Criminal Law, 6th Edition, N.M. Tripathi Pvt Ltd., Mumbai (1983).
3. R.C. Nigam, Law of Crimes in India, Volume I, Asia Publishing House, New Delhi (1965).
4. (Chief Justice) M. Monir, Law of Evidence, 6th Edition, Universal Law Publishing Co. Pvt.Ltd., New Delhi (2002)
5.B. R. Sharma, Forensic Science in Criminal Investigation and Trials (6 th Edition).
6.Crime Scene Investigation Procedural Guide 1st Edition by Michael S. Maloney, Donald Housman, Ross M. Gardner

e-Learning Source:

- <https://youtu.be/yHFRqjS07D8>
- <https://youtu.be/QwRdDWtr5Uw>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	2	2	3	3	2	3	3	2	3	1	3	3	1	2	2	3	3
CO2	2	3	3	3	2	3	3	3	2	2	2	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2
CO4	2	2	3	3	3	2	2	2	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes	SDGs
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Integral University, Lucknow

FS401	CRIME SCENE INVESTIGATION & LAW	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.
		√	√	√			√	√	3,4



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS402	Title of the Course	FORENSIC PHOTOGRAPHY	L	T	P	C
Year	I	Semester	I	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The main objective of the subject is to develop the deep understanding about the crime, crime scene investigation and investigative techniques.						

Course Outcomes	
CO1	Students will be able to understand the basic principle and working of camera and its attachments.
CO2	Students will learn and identify the type of camera and file format to be used of a crime scene.
CO3	Students will be able to understand the various aspects and role of forensic photography in different crime scenes.
CO4	Students will be able to understand the different specialized techniques for crime scene photography.
CO5	Appraise the modern techniques of photography for the purpose of recording the crime scene.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Camera	Camera: Introduction, types of Cameras and their working principle, attachments of camera. Lens and types of camera lenses Image sensors, spectral sensitivity of photographic materials, reproduction of colors- photographic processing, Exposing, Camera exposure determination, F-Number, Depth of field, ISO, Exposure Index, angle, scale, ambient light, color, temperature, flash/ strobe. Developing and Printing.	6	CO1
2	Digital Photography	Digital photography: Introduction, Working principle and importance of SLR & DSLR Cameras. Basics of Digital Imaging Photography, photo-morphing, digital water marking and digital imaging. Software for digital photography. File formats for digital photographs – jpg, gif, bmp, tiff, mpeg, etc. Videography/high speed videography.	6	CO2
3	Forensic Photography	Forensic Photography: Introduction and role of forensic photography, selection, and use of equipment- Lenses, light sources, electronic flashes, filters etc. Evidentiary value of photographs. Different types of photography in indoor and outdoor scene of crime- aerial photography, close-up, midrange and bird-eye view photography, trick photography, contact photography. Significance Photography in Forensic Science.	6	CO3
4	Photographic Techniques	Photographic Technique: Methods, techniques and tactics of- Surveillance photography, High-speed photography, UV, IR, transmitted light and side light photography, Photomicrography, microphotography, telephoto and processing. Aerial Photography. Document and finger print photography. Photography in identification of docile and hostile human objects, etc. 3-D Photography/Videography,	6	CO4
5	Advanced Forensic Photographic Techniques	3D Modelling using photographs: Introduction, importance and its application in forensic science. Steps in 3- D modeling. Procedure of taking photo for 3-D model creation. Different tools and techniques used in 3D Modelling of photographs. 3-D printing in forensic science.	6	CO5

Reference Books:	
1.	The Practical Methodology of Forensic Photography (Practical Aspects of Criminal and Forensic Investigations) by David R. Red sicker
2.	Fundamentals of Forensic Photography: Practical Techniques for Evidence Documentation on Location and in the Laboratory (Applications in Scientific Photography) 1st Edition, by Keith Mancini, John Sidoriak Forensic Photography: Importance of Accuracy 1st Edition, by Sanford L. Weiss
3.	The Practical Methodology of Forensic Photography (Practical Aspects of Criminal and Forensic Investigations) by David R. Red sicker
4.	Edward M Robinson, Crime Scene Photography
5.	Redsicker, D. R., The Practical methodology of Forensic Photography, CRC Presss, London, 1994.
6.	Forensic Digital Image Processing: Optimization of Impression Evidence 1st Edition by Brian Dalrymple, Jill Smith

e-Learning Source:	
1.	https://www.sciencedirect.com/science/article/pii/S2589871X21000759#:~:text=3DFS%20is%20an%20interdisciplinary%20field,engage%20with%20and%20understand%20evidence
2.	https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==
3.	https://youtu.be/1fm407zPcnI

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	2	2	3	3	2	3	3	2	3	1	3	3	1	2	2	3	3
CO2	2	2	3	3	2	3	3	3	2	2	2	3	3	3	3	3	3	3
CO3	3	3	3	3	3	1	3	3	3	3	3	3	3	3	2	3	2	2
CO4	2	2	3	1	3	2	2	2	3	3	3	3	3	3	3	1	3	3
CO5	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation
Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
FS402	FORENSIC PHOTOGRAPHY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS403	Title of the Course	BIOCHEMICAL & ANALYTICAL TECHNIQUES	L	T	P	C
Year	I	Semester	I	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The main objective of the subject is to develop a deep understanding among the students about the different type of biochemical and analytical techniques and their importance in forensic science.						

Course Outcomes	
CO1	Students will have a deep understanding and knowledge about the general principles and analytical techniques of biochemical analysis.
CO2	To understand the Immuno-chemical and Chromatographic Techniques in detail.
CO3	To understand the deep knowledge of Electrophoresis and Mass Spectrometry
CO4	Students will have a deep knowledge of Molecular Biology Techniques
CO5	To understand the deep knowledge of various analytical techniques pertaining to forensic science.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Biochemical Analysis and Techniques	General Principles of Biological / Biochemical Analysis: - pH and buffers Physiological solution, Cell and tissue culture, Cell fractionation, biological variations etc. Centrifugation Techniques: - Basic principles of sedimentation, various types of centrifuges, Density gradient centrifugation, Preparative centrifugation, Analysis of sub-cellular fractions, Ultra- centrifuge- Refrigerated Centrifuges. Microscopy: - Basic Principles, simple and compound microscope, comparison microscope, phase contrast Microscope, Stereoscopes microscope, Polarizing microscope, Fluorescent Microscopy, infra-red Microscopy, Scanning electron Microscope (SEM) & Transmission Electron Microscope (TEM).	8	CO1
2	Immuno-chemical and Chromatographic Techniques	Immuno-chemical Technique: - General principles, production of antibodies, Precipitin reaction, Gel Immuno-diffusion, Immuno- electrophoresis, complement fixation, Radio Immuno Assay (RIA), ELISA, Fluorescence immune assay. Chromatographic Techniques: - General Principles, Paper chromatography, column chromatography, TLC, Absorption chromatography, Partition chromatography, Gas chromatography, Gas-liquid chromatography, Ion exchange chromatography, Exclusion (permeation) chromatography, Affinity chromatography, HPLC, HPTLC, Capillary chromatography, Interfacing GC with IR spectrometry.	8	CO2
3	Electrophoresis and Mass Spectrometry	Electrophoretic Technique: - General principles, Factors affecting electrophoresis, Low voltage thin sheet electrophoresis, High voltage electrophoresis, Sodium dodecyl-sulphate (SDS) Polyacrylamide gel electrophoresis, Iso-electric focusing (IEF), Iso-electrophoresis, Preparative electrophoresis, Horizontal and Vertical electrophoresis. Mass Spectrometry: -Introduction, Principle, Instrumentation, Data handling, Correlation of mass spectra and molecular structure, Fourier transform mass spectrometry, Introduction to Tandem mass spectrometry, inductively coupled plasma MS (ICP-MS), Ion Microprobe Mass Analyzer (IMMA), HR GCMS, LCMS, Secondary Mass Spectroscopy, Laser Mass spectrometry-LCMS, ESI-MS	8	CO3
4	Molecular Biology Techniques	Molecular Biology Techniques: - Outline of Genetic Manipulations, Enzymes and in genetic manipulation, Cloning procedures, Isolation of specific nucleic acid sequences – complementary DNA, Gene libraries, Colony hybridization, Nick translation, Oligo nucleotide probes, Expression of genes.	8	CO4
5	Analytical Techniques	Analytical Techniques: - Basic concepts in analytical methods qualitative and quantitative methods Volumetric gravimetric electrometric, potentiometric, chromatographic methods Calorimetric, spectrophotometric, spectroscopic techniques	8	CO5

Reference Books:	
1. Chapman, J.R., Practical Organic Mass spectrometry, A Guide for Chemical and Biochemical Analysis, Wiley, New York, 1993.	
2. Lide, D.R., Handbook of Chemistry & Physics C.R.C. 75th ed. CRC Press Washington D.C., 1994	
3. Stout G.H., & Jensten, L.H., X-ray Structure Determination – A practical Guide, 2nd Ed., Wiley, New York, 1989	
4. Willard, H.H. et al, Instrumental Methods of Analysis, CBS Publishers and Distributors, Delhi 1986	
5. Sneddon, J., Advances in Atomic Spectroscopy, Vol. I & II, JNI Press 1992 & 1994.	
e-Learning Source:	
1. https://youtu.be/iHrKsfw827c	
2. https://youtu.be/u_hz7_KN7hE	

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	2	2	3	3	3	3	3	3	2	2	3	3	3	3	3
CO2	3	2	3	3	3	3	2	3	2	3	3	3	2	2	3	3	3	2
CO3	3	3	3	3	3	3	2	3	2	2	2	3	3	3	3	3	3	2
CO4	2	3	3	3	3	3	3	2	3	3	3	3	3	3	3	2	2	3
CO5	2	3	2	2	3	3	3	2	3	3	2	2	3	3	3	3	3	3

2- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code		Course Title		Attributes							SDGs No.	
FS403		BIOCHEMICAL & ANALYTICAL TECHNIQUES		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
				√	√	√			√	√	3,4	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS404	Title of the Course	FORENSIC BOTANY & ENTOMOLOGY	L	T	P	C
Year	I	Semester	I	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The main objective of the subject is to develop a deep understanding and knowledge about the botanical and entomological evidence.						

Course Outcomes	
CO1	Students will be able to deeply understand the importance and role of forensic botany in the field of forensic science.
CO2	After completion of the module, students will deeply understand the role of diatoms and pollen in a forensic investigation.
CO3	Students will have a deep understanding and knowledge of wildlife forensics.
CO4	Students will learn and practice the various aspects of forensic entomology
CO5	Students will be able to analyze the forensically important insects and interpret the findings in court proceedings.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Forensic Botany	Forensic Botany: - Introduction, Scope, and Significance, Various types of evidences related to forensic botany like wood, timber varieties, seeds, and leaves, their examination, identification, analysis, and comparison. Source Identification of biological & botanical evidence, documentation of biological & botanical evidences. Evidence recognition and analysis.	8	CO1
2	Diatoms & Pollen	Diatoms: Introduction, Classification, morphology, methods of isolation from water and different types of tissue, its examination, identification, analysis, and comparison. Forensic importance of diatom, in drowning cases. Case study Pollen: Introduction to Pollen grains their identification, scope, and significance in relation with criminal identification, Examination, and identification of starch grains and powder.	8	CO2
3	Wild Life Forensic	Wild Life Forensic: - Introduction and importance of wild life, protected and endangered species of animals and plants, wildlife species – Identification and examination of physical evidence by conventional and modern methods, Identification of pug marks of various animals, census of wildlife population. Wildlife/environment protection act.	8	CO3
4	Forensic Entomology	Forensic Entomology- Introduction, Scope and significance of terrestrial and aquatic insects in forensic investigations and their role in crime detection. Insect's succession and its relationship to determine time since. Impact of ecological factors on insect's developments.	8	CO4
5	Forensic Entomology & Law	Identification & Ecology of Forensically Important flies & beetles Life stages of fly & beetles, the influence of the environment on specific insect species. Succession of insect species on the corpse and its role in post mortem estimation. Statement of witness, council for registration of forensic practitioners, communicating entomological facts in court, physical evidences. Its continuity & integrity.	8	CO5

Reference Books:

1. Richard Saferstein; Forensic Science Hand Book; Ed.; Prentice – Hall, Englewood Cliff, New jersey; (1982)
2. Dutelle, Aric W. An introduction to crime scene investigation. Jones & Bartlett Publishers, 2011
3. Tersigni-Tarrant, MariaTeresa A., and Natalie R. Shirley, eds. Forensic anthropology: an introduction. CRC Press, 2012
4. Coyle, Heather Miller, ed. Forensic botany: principles and applications to criminal casework. CRC Press, 2004.
5. Smith; DGV; A manual of Forensic Entomology Ithaca New York Camstock Univ. Press, USA, (1986)

e-Learning Source:

1. https://youtu.be/E_9L9T_ZY5w
2. <https://youtu.be/nBNIM1So6tM>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
CO2	2	2	3	3	2	3	3	2	3	2	2	3	3	2	3	3	2	2
CO3	2	3	2	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	2	3	3	2	3	3	2	3	3	2	3
CO5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

3- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
FS404	FORENSIC BOTANY & ENTOMOLOGY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS405	Title of the Course	Recent Advancement in Forensic Science	L	T	P	C
Year	I	Semester	I	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Students will be able understand the principle of various types of biometric recognition systems and working of advanced techniques for the detection of truth and other forensic tools utilize for the investigation. They would also know the application of nanotechnology and engineering in various domains of forensic science						
Course Outcomes							
CO1	The students will able to understand the principle of various types of biometric techniques, their acceptance, advantages and disadvantages in the field of forensic investigation.						
CO2	The students will able to understand the scope of forensic engineering and investigation of various types of failures including electrical accidents, defects in material evidences and polymer materials.						
CO3	The students will able to understand the application of nanotechnology in fingerprint development, Military investigation, DNA, Narcotics and Drugs testing.						
CO4	The students will able to interpret the result acquired from advanced techniques such as narcoanalysis, brain mapping, lie detectionetc.with other advanced assisting techniques such as remote personal assessment, super imposition technique etc.						
CO5	The students will able to understand and apply the concept and application of alternative light photography, LA-ICP-MS, Digital surveillance for gaming equipment and develop the research aptitude.						

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Pattern Recognition & Biometrics	Pattern Recognition & Biometrics- Introduction to Biometrics, Pattern Recognition & Biometrics and its types – Face, Iris & retinal imaging, finger and palm print, Computer simulation, Image processing – Image capturing, Image restoration & enhancement. Image editing, Compression Technique – Proactive Forensic science, User Acceptance, Evaluating Accuracy, Advantages & disadvantages	6	CO1
2	Forensic Engineering	Forensic Engineering- Definition, causes, types of Failures, Ductile and Brittle Fracture, Fatigue Fracture, Distortion Failures, Wear Failures, Fretting Failures, Liquid Erosion Failures, Stress Corrosion Cracking, Liquid Metal Embrittlement, Hydrogen Embrittlement, Elevated Temperature Failures, Failures Related to Corrosion, Failures of Metallic Orthopedics Implant, Nuclear Failures. Investigation of electrical failures/accidents, Seeking defects in material evidences, Failure of Polymer materials.	6	CO2
3	Forensic Nanotechnology	Forensic Nanotechnology- Definition, Introduction, Scope and Application of nanotechnology, Application of nanotechnology in forensic science such as in fingerprint development, in Military such as explosives detection, GSR analysis, DNA, Narcotics and Drugs testing.	6	CO3
4	Advanced Tools and Techniques in Forensic Science	Advanced Tools and Techniques in Forensic Science- Portrait parley method, Narco-analysis, Brain Mapping, Polygraphy, Ballistic Fingerprinting, Binocular for identifying dangerous gases, Remote personal assessment, super imposition technique, Fire technology, 3D Scanner, High speed ballistics photography, Forensic carbon-14 Dating.	6	CO4
5	Application of advanced technology in forensic investigation	Definition, Concept and application of Alternative light photography, LA-ICP-MS, Digital surveillance for gaming equipment in forensic investigation. One research article.	6	CO5

Reference Books:	
1.	Biometrics: Theory, Methods, and Applications, N. V. Boulgouris, Konstantinos N. Plataniotis, Evangelia Micheli-Tzanakou, 2010
2.	New perspective of nanotechnology: role in preventive forensic Alok Pandya ¹ and Ritesh K Shukla, Egyptian Journal of Forensic Sciences, 1-11, (2018) 8:57
3.	James, S. H. And Nordby, J. J. (Eds) Forensic Science - An Introduction to Scientific and Investigative Techniques, CRC Press, London, 2003.
4.	Bernad Jahne: Digital Image processing, Springer Verlag (1993)
5.	L C Jain, H Hallic, I Hayaush, S. B Lee & S Tulsi: Intelligent Biometric Techniques in fingerprint and Face Recognition; CRC Press (1999)
e-Learning Source:	
1.	https://youtu.be/FZz2QPhV5M8
2.	https://youtu.be/VjHObyoNU2U
3.	https://youtu.be/JsDY4x7aJO8

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	2	2	3	3	2	3	3	2	3	1	3	3	1	2	2	3	3
CO2	2	2	3	3	2	3	3	3	2	2	2	3	3	3	3	3	3	3
CO3	3	3	2	3	3	1	3	3	3	3	3	3	3	3	2	1	2	2
CO4	2	2	1	1	3	2	2	2	2	3	3	3	1	3	3	3	3	3
CO5	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3

4- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code	Course Title	Attributes							SDGs No.
FS405	Recent advancement in Forensic Science	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS406	Title of the Course	CRIME SCENE INVESTIGATION & LAW-LAB	L	T	P	C
Year	I	Semester	I	0	0	4	2
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of this course is to give practical exposure to the students in the different aspects of crime scene investigation, give hands-on experience in handling physical evidences, packing and forwarding the evidences and their examination.						
Course Outcomes							
CO1	Students will be able to initiate the crime scene proceeding.						
CO2	Students will be able to search, collect and pack the various kind of evidences encountered at the crime scene.						
CO3	Students will be able to perform the investigation of various kind of crime scenes.						
CO4	Students will be able to understand the expert testimony and its importance.						
CO5	Students will be able to understand the ethics regarding crime scene investigation.						

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Basics of Forensic Science	1. Demonstration of crime scene processing (Protection and Documentation- photography, videography, sketching methods). 2. Perform mock homicide crime scene investigation 3. Perform mock suicide crime scene investigation (hanging/shot dead/poisoning etc.) 4. Perform mock hit and run crime scene investigation. 5. Reconstruction of scene of crime.	12	CO1
2	Physical Evidence	6. Identification and searching methods of physical evidences at the crime scene. 7. Collection, preservation, and packaging of physical evidences. 8. Identification of biological evidences at the crime scene	8	CO2
3	Criminal Justice System	9. Collection, preservation, and packaging of biological evidences.	4	CO3
4	Report Writing and Evidence Evaluation	10. To perform mock court testimony of expert evidences in different types of crime. 11. To demonstrate a moot courtroom testimony of expert witness.	6	CO4

Reference Books:																			
1. Crime Scene Investigation Procedural Guide 1st Edition by Michael S. Maloney, Donald Housman, Ross M. Gardner																			
2. B.R. Sharma, Forensic Science in Criminal Investigation and Trials - Universal Law Publishing Company, 2003, ISBN 817534332X, 9788175343320																			
3. James, S. H. And Nordby, J. J. (Eds) Forensic Science - An Introduction to Scientific and Investigative Techniques, CRC Press, London, 2003																			
4. Fisher, B., Techniques of Crime Scene Investigation (6thEdn.) CRC Press, Boca Raton, Florida, 2000.																			
5. Fundamentals of Forensic Science 3rd Edition 2015 Max M. Houck and Jay A. Siegel.																			
e-Learning Source:																			
1. https://youtu.be/wcCu2RsFAkA																			
2. https://youtu.be/2QypJrAq_6A																			

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																			
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7	
CO1	3	2	2	3	3	2	3	3	2	3	1	3	3	1	2	2	3	3	
CO2	2	3	3	3	2	3	3	3	2	2	3	3	3	3	3	3	3	3	
CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	
CO4	2	2	3	3	3	2	2	2	3	3	3	3	3	3	3	3	3	3	
CO5	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3	

5- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

		Attributes & SDGs								
Course Code	Course Title	Attributes							SDGs No.	
FS406	CRIME SCENE INVESTIGATION-LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
		√	√	√			√	√	3,4	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS407	Title of the Course	Forensic Photography-LAB	L	T	P	C
Year	I	Semester	I	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of this course is to give practical exposure to the students in crime scene photography using different type of camera, light, filters etc.						

Course Outcomes	
CO1	Students will be able to understand the working of analog and digital camera.
CO2	Resolve the issues arising in taking focused, photographs
CO3	Practice the gained knowledge for indoor crime scene photography.
CO4	Practice the gained knowledge for outdoor crime scene photography.
CO5	Interpret the results acquired from photography evidence and reconstruct the crime scene.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1 To 5	Forensic Photography	1. To understand the working of digital and analog camera. 2. To take photography of individual /group under various light conditions (bright, moderate, dark) in full passport and postcard size 3. To perform landscape photography and distance photography for understanding the phenomenon of focusing camera. 4. To take sequential photography 5. To perform photography for fixing the location of crime scene (indoor and outdoor – five scenarios). 6. To perform crime scene photography for indoor crime scene (burglary) 7. To perform crime scene photography for indoor crime scene (hanging) 8. To perform crime scene photography for indoor crime scene (murder) 9. To perform crime scene photography for outdoor crime scene (vehicular accident) 10. To perform crime scene photography for outdoor crime scene (murder)	30 Hrs.	CO1 to CO5

Reference Books:	
1.	Redsicker, D. R., The Practical methodology of Forensic Photography, CRC Presss, London, 1994.
2.	Criminalistics, An Introduction to Forensic Science: Richard Saferstein, 10th Edition, Pearson Education International
3.	The Practical Methodology of Forensic Photography (Practical Aspects of Criminal and Forensic Investigations) by David R. Redsicker
4.	Fundamentals of Forensic Photography: Practical Techniques for Evidence Documentation on Location and in the Laboratory (Applications in Scientific Photography) 1st Edition, by Keith Mancini , John Sidorik
5.	Forensic Photography: Importance of Accuracy 1st Edition, by Sanford L. Weiss
e-Learning Source:	
1.	https://www.sciencedirect.com/science/article/pii/S2589871X21000759#:~:text=3DFS%20is%20an%20interdisciplinary%20field,engage%20with%20and%20understand%20evidence
2.	https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==
3.	https://youtu.be/Ifm4o7zPcnI

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	2	2	3	3	2	3	3	2	3	1	3	3	1	2	2	3	3
CO2	2	2	3	3	2	3	3	3	2	2	2	3	3	3	3	3	3	3
CO3	3	3	3	3	3	1	3	3	3	3	3	3	3	3	2	3	2	2
CO4	2	2	3	1	3	2	2	2	3	3	3	3	3	3	3	1	3	3
CO5	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3

6- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs									
Course Code	Course Title	Attributes							SDGs No.
FS407	FORENSIC PHOTOGRAPHY-LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√			√	√	
									3,4



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS408	Title of the Course	FORENSIC BOTANY & ENTOMOLOGY-LAB	L	T	P	C
Year	I	Semester	I	0	0	4	2
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of this course is to give practical exposure to the students to perform the crime scene investigation of botanical evidences, examine and compare the diatoms, pollen grains, pug marks etc.						

Course Outcomes	
CO1	Students will be able to identify and perform the crime scene investigation of botanical evidences.
CO2	Students will be able to examine and compare the diatoms
CO3	Students will be able to examine and compare the pollen grains.
CO4	Students will be able to examine and compare the pug marks of the animals.
CO5	Students will be able to understand the threats of wildlife by studying the cases.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Forensic Botany	1. Identify the various botanical evidences present at the crime scene.	4	CO1
2	Diatoms & Pollen	2. Examination and comparison of diatoms from different sites 3. Case study related to diatoms 4. Examination and comparison of pollen grains 5. Case study related to pollen grains	4	CO2
3	Wild Life Forensic	6. Examination of pug marks.	4	CO3
4	Forensic Entomology	7. Case study on Forensic Entomology.	4	CO4
5	Forensic Entomology & Law	8. To study the Entomological facts in court as evidence	4	CO5

Reference Books:	
1. Richard Saferstein; Forensic Science Hand Book; Ed.; Prentice – Hall, Englewood Cliff, New jersey; (1982)	
2. Dutelle, Aric W. An introduction to crime scene investigation. Jones & Bartlett Publishers, 2011	
3. Tersigni-Tarrant, MariaTeresa A., and Natalie R. Shirley, eds. Forensic anthropology: an introduction. CRC Press, 2012	
4. Coyle, Heather Miller, ed. Forensic botany: principles and applications to criminal casework. CRC Press, 2004.	
5. Smith; DGV; A manual of Forensic Entomology Ithaca New York Camstock Univ. Press, USA, (1986)	
e-Learning Source:	
1. https://youtu.be/E_9L9T_ZY5w	
2. https://youtu.be/nBNIM1So6tM	

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
CO2	2	2	3	3	2	3	3	2	3	2	2	3	3	2	3	3	2	2
CO3	2	3	2	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	2	3	3	2	3	3	2	3	3	2	3
CO5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

7- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs									
Course Code	Course Title	Attributes							SDGs No.
FS408	FORENSIC BOTANY & ENTOMOLOGY-LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2021-22

Course Code	FS409	Title of the Course	SEMINAR, JOURNAL CLUB AND GROUP DISCUSSION	L	T	P	C
Year	I	Semester	I	0	4	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	This course will serve as a platform for students to enhance presentation skills.						

Course Outcomes

CO1	The students will understand and interpret latest advancements through different technical papers, reports, Journals, Data sheets, books etc
CO2	The students will inculcate the skills for literature survey and will learn to manage resources effectively.
CO3	The students will be able to summarize the recent research and technologies in the form of review and will be able to deliver power point presentation on an assigned topic.
CO4	The students will be able to communicate his/her ideas with his peers as an audience, which will enhance both oral and written communication skills.
CO5	The students will be able to create interest to pursue lifelong learning.

SEMINAR PRESENTATION ASSESSMENT FORM

Name of Student:		Session:	
Enrolment Number:		Date:	
Name of Subject:	Seminar, Journal Club And Group Discussion	Subject code:	FS409
Topics:			

Criteria	Sub-Criteria	Max. Marks	Marks Obtained
Introduction (Max marks-10)	Use appropriate background information	04	
	Has clear statement of purpose	04	
	Shows a logical sequence	02	
Factual Content (Max marks- 20)	Includes accurate information	04	
	Shows up-to-date content	04	
	Presents relevant content	04	
	Shows in-depth and sufficient details	02	
	Addresses all important issues	02	
	Is selective	02	
	Use of proper English Grammar in the text	02	
Presentation Quality (Max marks-06)	Has a good design of presentation (appropriate font, type, size, color, matter per slide etc.)	04	
	Has a clear verbal expression and eye contact with audience	02	
Response to questions (Max marks-10)	Answers question(s) correctly	04	
	Has the ability to think on the spot	04	
	Shows an ability to defend content of presentation	02	
Time Management (Max. mark-04)	Completes the presentation within allocated time	04	
Total Marks		50	

Note: In case of Oral Presentation, each student will be assessed in a 20 minutes time (15 min for presentation & 5 min for discussion) out of 50 marks.

Comments/Suggestions:

(Name and signature of Incharge)

(Head, Paramedical)

EVALUATION OF SEMINAR

The evaluation for internal examination of 100 marks will be distributed:

Seminar Presentation=50 marks.

Viva voce =45 marks

Attendance=5 marks

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	2	3	1	2	1	-	-	3	2	3	3	2
CO2	3	3	3	3	2	2	3	2	1	3	-	-	2	2	3	2	3
CO3	3	3	3	3	2	2	3	2	1	3	-	-	3	2	2	2	3
CO4	3	3	3	3	2	2	3	2	1	3	-	-	2	3	2	2	3
CO5	3	3	3	3	2	2	3	2	1	3	-	-	3	2	3	3	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
FS409	SEMINAR, JOURNAL CLUB AND GROUP DISCUSSION	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√			√	√	3,4,9, 17



INTEGRAL UNIVERSITY, LUCKNOW
INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

MASTER OF SCIENCE IN FORENSIC SCIENCE
(M. Sc. FS.)

SYLLABUS

YEAR/ SEMESTER: I/II



Integral University, Lucknow
Department of Paramedical Sciences
Study and Evaluation Scheme

Program: M.Sc.F.S.

Semester-II

S. N.	Coursecode	Course Title	Typeof Paper	PeriodPerhr./week/Sem			EvaluationScheme				Subtotal	Credit	Total Credits
				L	T	P	CT	TA	Total	ESE			
THEORIES													
1.	FS410	Dermatoglyphics & Impressions	Core	2	1	0	40	20	60	40	100	2:1:0	3
2.	FS411	Questioned Documents	Core	3	1	0	40	20	60	40	100	3:1:0	4
3.	FS412	Forensic Chemistry & Explosive	Core	3	1	0	40	20	60	40	100	3:1:0	4
4.	FS413	Forensic Medicine &Toxicology	Core	3	1	0	40	20	60	40	100	3:1:0	4
5.	FS414	Cyber Forensic	Core	2	1	0	40	20	60	40	100	2:1:0	3
6.	FS415	Speaker Identification &Voice Analysis	Core	2	1	0	40	20	60	40	100	2:1:0	3
PRACTICAL													
1.	FS416	Dermatoglyphics & Impressions- Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
2.	FS417	Questioned Documents- Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3.	FS428	Forensic Chemistry & Explosive- Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
4.	FS419	Forensic Medicine &Toxicology- Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
5.	FS420	Cyber Forensic – Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
Total				15	06	10	440	220	660	440	1100	26	26

S. N.	Course code	Course Title	Type of Paper	Attributes							United Nation Sustainable Development Goals (SDGs)
				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
THEORIES											
1.	FS410	Dermatoglyphics & Impressions	Core	√	√	√			√	√	3,4
2.	FS411	Questioned Documents	Core	√	√	√			√	√	3,4
3.	FS412	Forensic Chemistry & Explosive	Core	√	√	√			√	√	3,4
4.	FS413	Forensic Medicine & Toxicology	Core	√	√	√			√	√	3,4
5.	FS414	Cyber Forensic	Core	√	√	√			√	√	3,4
6.	FS415	Speaker Identification & Voice Analysis	Core	√	√	√			√	√	3,4
PRACTICAL											
1.	FS416	Dermatoglyphics & Impressions- Lab	Core	√	√	√			√	√	3,4
2.	FS417	Questioned Documents- Lab	Core	√	√	√			√	√	3,4
3.	FS428	Forensic Chemistry & Explosive- Lab	Core	√	√	√			√	√	3,4
4.	FS419	Forensic Medicine & Toxicology- Lab	Core	√	√	√			√	√	3,4
5.	FS420	Cyber Forensic- Lab	Core	√	√	√			√	√	3,4

L:Lecture **T:**Tutorials **P:** Practical **CT:**Class Test **TA:**Teacher Assessment **ESE:**End Semester Examination,
AE:Ability enhancement, **DSE:**Discipline Specific Elective, **Sessional Total:**Class Test+Teacher Assessment **Subject Total:**Sessional Total+End Semester Examination(ESE)



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS410	Title of the Course	DERMATOGLYPHICS & IMPRESSIONS	L	T	P	C
Year	I	Semester	II	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Main objective of the subject is to intellectualize the students about the fingerprints as well as other impressions and their forensic significances.						

Course Outcomes	
CO1	Students will be able to understand the history and classification of fingerprints in detail.
CO2	Students will be able to understand the development of fingerprints and their development techniques.
CO3	After completion of the course students will be able to understand the examination of the fingerprints found at crime scene.
CO4	Students will be able to understand the examination of foot prints and gait pattern.
CO5	After completion of the course students will be able to understand the examination of lip prints, ear prints and bite marks.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction of Fingerprints	Introduction, history and development of fingerprints, formation of ridges, pattern types, pattern areas, classification of fingerprints – Henry system of classification, single digital classification, extension of Henry system, search of fingerprints, fingerprint bureau.	6	CO1
2	Development of Fingerprints	Chance fingerprints, latent & visible fingerprints, plastic fingerprints, ridge tracing and ridge counting, development of latent fingerprints, conventional methods of development of fingerprints – fluorescent method, magnetic power method, fuming method, chemical method etc. digital imaging and enhancement, application of laser and other radiations to develop latent fingerprints, metal deposition method and development of latent print on skin.	6	CO2
3	Examination of Fingerprints	Taking of finger prints from living and dead persons, preserving and lifting of fingerprints, photography of fingerprints, digital transmission, comparison of fingerprints, basis of comparison, class characteristics, individual characteristics, various types of ridge characteristics, automatic fingerprint identification system.	6	CO3
4	Foot prints	Foot prints: - Importance, gait pattern, casting of footprints in different medium, electrostatic lifting of latent footprints, taking of control sample. Tyre marks / prints and skid marks, taking of control samples.	6	CO4
5	Lip Prints, Ear Prints and Bite Marks	Lip prints, Natural, location, collection and evaluation. Bite marks, Forensic significance, photography, lifting and preservation of bite marks and evaluation. Ear prints, Forensic significance, location, collection and evaluation. Taking of control samples of lip print and ear print for comparison	6	CO5

Reference Books:	
1.	J. A., Sukoo, R. J, and Knupfer (2000), “Encyclopedia of Forensic Science”, Siegel, Academic Press
2.	Champod, C., Lennard, C. J., Margot, P., & Stoilovic, M. (2017). Fingerprints and other ridge skin impressions. CRC press
3.	Henry C. Lee and R. E. Gaensslen, “Advances in Fingerprint Technology”, Second Edition.
4.	Fingerprint Manual, Division of Health Improvement
5.	J.E. Cowger, Friction Ridge Skin, CRC Press, Boca Raton (1983)
e-Learning Source:	
1.	https://youtu.be/Fn5dAM-fKDQ
2.	https://youtu.be/pU_Ap4ZwBrc

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	2	3	3	3	2	3	3	3	2	2	3	3	3	3	3	3	2	3
CO2	3	3	3	3	2	3	3	3	3	3	3	2	3	2	2	3	2	3
CO3	3	3	3	3	3	3	3	2	2	3	3	2	3	3	3	3	3	3
CO4	3	2	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3	2
CO5	3	2	3	3	3	3	2	3	3	3	3	3	3	2	2	3	3	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs									
Course Code	Course Title	Attributes							SDGs No.
FS410	DERMATOGLYPHICS & IMPRESSIONS	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS411	Title of the Course	QUESTIONED DOCUMENTS	L	T	P	C
Year	I	Semester	II	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The major objective of the subject is to intellect the students about the diminutiveness examination of questioned documents i.e. - forged handwritten documents or printed documents, paper and ink examination etc.						

Course Outcomes	
CO1	After studying this paper, the students will be able to classify the documents and perform the preliminary examination
CO2	Students will be able to understand the concepts of handwriting individuality.
CO3	After studying this unit, the students will be able to examine the disguised writing and anonymous letters for the identification purpose.
CO4	Students will be able to detect and examine various types of forgeries and various types of questioned documents.
CO5	Students will be able to determine the age of the documents using various examinations.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction of Documents	Nature and problems of document: - Classification of documents, procurement of standard admitted / specimen writings, handling and marking of documents, preliminary examination of documents.	8	CO1
2	Handwriting Examination	Basic of handwriting identification, individuality of handwriting, natural variations, process of comparison, various types of documents genuine and forged documents, holographic documents, various writing features and their estimation, general characteristics of handwriting, individual characteristics of handwriting, basic tools needed for forensic documents examination and their use.	8	CO2
3	Disguised writing and anonymous letters	Disguised writing and anonymous letters: - Identification of written, examination of signatures characteristics of genuine and forged signatures, examination of alterations, erasers overwriting, additions and obliterations decipherment of secret, indented and charred documents, examination of seal impression and other mechanical impressions.	8	CO3
4	Examination of Documents	Examination of Documents: - Xeroxed copies, carbon copies, fax message forgeries and their detection, various types of forgeries and their detection. Examination of built-up documents determination of sequence of strokes, physical matching of documents, identification of type writings, identification of typist, identification of printed matter, various types of printing of security documents, printing of currency notes, examination of counterfeit currency notes, passports, visa, stamp papers, postal stamps, etc.	8	CO4
5	Determination of Age of Documents	Determination of age of documents by examination of signature: – Paper, ink and writing / signatures etc. examination of computer printout, identification of dot-matrix, ink-jet and laser printers, electronic typewriter, credit cards, forensic stylistics, forensic linguistics, e-documents, digital signatures, an introduction to computer forensic opinion writing, reason for opinion.	8	CO5

Reference Books:	
1.	Albert, S. Osborn, Questioned Documents, Second Ed., Universal Law Publishing, Delhi, 1998
2.	Charles, C. Thomas, I.S.Q.D. Identification System for Questioned Documents, Billy Prior Bates, Springfield, Illinois, USA, 1971
3.	Hard less, H.R., Disputed Documents, handwriting and thumbs – print identification: profusely illustrated, Low Book Co., Allahabad, 1988
4.	Kurtz, Sheila, Graphotypes a new plant on handwriting analysis, Crown Publishers Inc., USA, 1983.
5.	Wilson, R., Harrison, Suspect Documents – Their Scientific Examination; Universal Law Publishing, Delhi, 1997
e-Learning Source:	
1.	https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==#
2.	https://youtu.be/Is6t1EP_3eg

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
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CO3	2	3	3	3	2	3	3	3	3	3	2	3	2	2	3	2	3	3
CO4	3	3	3	3	3	2	2	3	3	2	3	2	2	3	2	3	2	3
CO5	3	3	2	2	3	3	3	3	3	2	3	3	3	3	2	3	2	3

2- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code	Course Title	Attributes							SDGs No.
FS411	QUESTIONED DOCUMENTS	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS412	Title of the Course	FORENSIC CHEMISTRY & EXPLOSIVES	L	T	P	C
Year	I	Semester	II	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of the subject is to develop deep skill and knowledge among the students about the chemical examination of different types of food and beverages, petroleum products and explosive evidences encountered in various types of crimes.						
Course Outcomes							
CO1	After completion of this unit, students will be able to examine the alcoholics & non-alcoholic beverages and drugs.						
CO2	Students will be able to examine the petroleum product.						
CO3	Students will have the deep understanding and knowledge of explosives.						
CO4	After completion of the unit students will be able to understand the phenomena of explosion.						
CO5	Students will be able to understand the examination of explosives and arson.						

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Forensic Chemistry & Beverages	Forensic Chemistry: - Introduction, definition scope and significance types of cases/exhibits, preliminary screening, presumptive test, examination procedures involving standard methods and instrumental techniques, analysis Beverages: alcoholic and non-alcoholic, country-made liquor, illicit liquor and medicinal preparations containing alcohol and drugs as constituents, drugs of abuse: introduction, classification of drugs of abuse, drug of abuse in sports, narcotics drugs and psychotropic substances, designers' drug and their forensic examination.	8	CO1
2	Petroleum products & its Examination	Examination of petroleum products: - Distillation and fractionation, various fractions and their commercial uses, standard methods of analysis of petroleum products for adulteration. Analysis of trace evidence: cosmetics, dyes, Trap related evidence materials Quantitative and qualitative analysis of chemical fertilizers, insecticides, metallic and non-metallic products, consumer items such as gold, silver, tobacco, tea, sugar, salts, acids, and alkalis etc.	8	CO2
3	Explosives	Explosives: Introduction, classification, scope, significance different type of explosive, explosive composition, different characteristics of explosives. Dynamite, its classification and examination, water gel explosive, blasting agents, binary explosive, sheet explosive, plastic explosive, boosters, blasting cap, home-made bombs, explosive train, detonators and its type. Introduction, Components, Type of IEDs, (Molotov cocktail, Letter bomb, Pipe bomb, VBIED and CBRN), Explosives Initiation (Explosive Trains), IEDs explosion process and affects. Definition, composition, characteristics, and types of pyrotechnique, mechanism of firework.	8	CO3
4	Explosion Phenomena	Explosion phenomena, its process and effects, types of hazards, effect of blast wave on structures, human etc. specific approach to scene of explosion, post-blast residue collection, preservation, packing and forwarding. Reconstruction of sequence of events, evaluation and assessment of scene of explosion.	8	CO4
5	Examination of Explosives and Arson	Systematic examination of explosives and explosion residues in the laboratory using chemical and instrumental techniques and interpretation of results. Introduction to Fire & Arson, origin, cause, motives and, chemistry of Fire, Firefighting operations, preservation of fire scene, collection of evidences. Analysis of fire debris: Extraction of fire accelerants from fire debris, advantages and their limitations. Methods and techniques used in identification of fire accelerant.	8	CO5

Reference Books:

1. Richard Saferstein; Forensic Science Hand Book; Ed.; Prentice – Hall, Englewood Cliff, New jersey; (1982)
2. Dutelle, Aric W. An introduction to crime scene investigation. Jones & Bartlett Publishers, 2011
3. Tersigni-Tarrant, MariaTeresa A., and Natalie R. Shirley, eds. Forensic anthropology: an introduction. CRC Press, 2012
4. Coyle, Heather Miller, ed. Forensic botany: principles and applications to criminal casework. CRC Press, 2004
5. Smith; DGV; A manual of Forensic Entomology Ithaca New York Camstock Univ. Press, USA, (1986)

e-Learning Source:

1. <https://youtu.be/tLrTITLcsQM>
2. https://youtu.be/p694_czdTMY

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3
CO2	2	3	3	3	2	3	2	3	3	3	3	3	2	3	3	3	2	3
CO3	3	2	3	3	3	2	2	3	2	3	3	2	3	2	3	3	2	3
CO4	3	3	2	2	3	2	3	3	3	3	2	3	3	2	3	3	3	3
CO5	2	3	3	2	3	3	3	3	3	3	3	3	3	3	2	2	3	3

3- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
FS412	FORENSIC CHEMISTRY & EXPLOSIVES	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS413	Title of the Course	FORENSIC MEDICINE & TOXICOLOGY	L	T	P	C
Year	I	Semester	II	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Main objective of the subject is to give a deep knowledge about forensic aspects of death and wounds and make the students skillful in accordance to examine the toxicological evidences encountered in various types of crimes.						

Course Outcomes	
CO1	After completion of the unit students will be able to understand the concept of toxicological examination.
CO2	After completion of the unit students will be able to understand the extraction and isolation of poisons using various instrumental techniques.
CO3	Students will be able to understand the examination procedure of poisons.
CO4	After completion of the unit students will be able to understand the medico-legal concepts of forensic medicine.
CO5	After completion of the unit students will be able to understand the metabolism of drugs.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction to Toxicology	Forensic Toxicology: - Introduction and concept of forensic toxicological examination and its significance. Poisons: - Classification of poison, types of poisoning, collection and prevention of toxicological exhibits in fatal and survival cases, signs and symptoms of poisoning, mode of action and its effect on vital functions, medico-legal and post mortem examination report finding studies, specific analysis plan / approach to toxicological examination of poisoning samples.	8	CO1
2	Instrumental Techniques in Poisoning	Extraction, Isolation and Clean up procedure using conventional as well as modern techniques such as solid phase extraction techniques, separation of poisons and drugs using chromatographic and Electrophoretic techniques, identification and estimation of poisons and drug using chromatographic and spectrophotometric and other instrumental methods, ingestion of drugs and their metabolism in the body significance of analytical studies with respect of forensic examination.	8	CO2
3	Examination of Poisons	Examination of metallic poisons, volatile poisons, snake venom, insects bites, and poisons involving animal poisoning cases and their examination, interpretation of toxicological findings and preparation of report, limitations of methods and trouble shooting in toxicological examinations, disposal of analyzed samples, some interesting cases of common and specific poisons and their importance in view of the specific scientific approach in examinations	8	CO3
4	Forensic Medicine	Forensic Medicine: - Introduction, General Definition, Scope and Significance, Medico-legal aspects of Death, Asphyxia, Starvation, Electrocution and Accidental and Drowning cases, Determination of time since death by various methods including histo-pathological methods, determination of age of living person. Injuries-ante-mortem injuries, aging of injury, artificial injury wounds.	8	CO4
5	Drug Metabolism	Forensic Pharmacological studies, absorption, distribution, metabolism, pathway of drug metabolism, drug metabolism and drug toxicity, excretion of drug and poisons, detection of poisons on the basis of their metabolism studies, interpretation of analytical data and forming of opinions. Abortion, Infanticide, Sexual offences.	8	CO5

Reference Books:	
1.	Modi, Jaishring P., Textbook of Medical Jurisprudence & Toxicology, M.M. Tripathi Pub., 2001
2.	Mule, S.J. et al., Immunoassays for Drugs subjects to ab, CRC Press USA, 1974
3.	Sunshine, I., Guidelines for Analytical Toxicology Programme, Vol. I, CRC Press, USA, 1950
4.	Sunshine, Methods of Analytical Toxicology, CRC Press USA, 1975
5.	Working Procedure Manual – Toxicology, BPR&D Publication, 2000
e-Learning Source:	
1.	https://youtu.be/eVKO2NV07Eo
2.	https://www.youtube.com/live/fMXXqsZa4Uk?feature=share

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	2	3	3	3	2	3	3	3	3	3	2	3	2	3	3	3	3	2
CO2	3	2	2	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
CO3	3	2	3	3	3	2	3	3	3	2	3	3	3	3	2	2	2	3
CO4	3	3	3	2	3	3	3	3	3	3	3	3	2	3	3	2	3	3
CO5	2	3	3	3	2	3	3	3	2	3	3	3	3	2	3	3	3	2

4- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
FS413	FORENSIC MEDICINE & TOXICOLOGY	L	T	P	C	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS414	Title of the Course	CYBER FORENSIC	L	T	P	C
Year	I	Semester	II	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Objective of the subject is to develop a deep understanding about the cyber forensic and evidences related to cyber-crime and their investigation as well as to aware the students about the laboratory management and standards.						

Course Outcomes	
CO1	After completion of the unit, students will be able to understand the fundamentals and concepts of cyber forensic.
CO2	After completion of the unit, students will have a piece of deep knowledge and understanding of computer crimes.
CO3	After completion of the unit, students will be able to learn the protocols of search & seizure of evidence related to cyber forensic.
CO4	After completion of the unit, students will be able to understand the need of quality management at forensic laboratories.
CO5	After completion of the unit, students will be able to understand the technical requirements & Laboratory Management system.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction to Cyber Forensic	Cyber Crimes- Definition, motives, and classification of cyber-crimes. Modus operandi of cyber-crime, types of cyber-crimes viz. hacking, obscenity pornography, Programme manipulation, software piracy, intellectual property and computer security, Email Scams (Phishing/Credit Card), Cyber laundering, Online gambling, Cyber Terrorism, and Hybrid Terrorism, Email Spoofing, Illegal trafficking, etc.	6	CO1
2	Modes & Manner of Cyber Crime	Modes & Manner of committing Cyber Crime, Cracking & Hacking, Data Theft, Email bombing, Data Didling, Salami attacks, DOS & D-DOS attack, Virus/worm attacks, Logic bombs, Internet time theft, electronic eavesdropping, Cyber stalking& Cyber Bullying, Password sniffing, Cyber-squatting, Spoofing & masquerading, Identity theft, Cyber venting, Cyber defamation, Social Media Crimes	6	CO2
3	Search and Seizures of Evidence	Search and Seizures of Evidence: - Cyber Forensic, Cardinal Rules of Cyber Forensic Investigation of cyber-crimes, tools for analysis, Command line forensic tools, GUI based forensic tools, Imaging of digital media, restoration of deleted files, password cracking and E-mail tracking, Encryption and Decryption methods.	6	CO3
4	Emerging Trends in Cyber Forensics	Internet of Things (IoT) Forensics: IoT device analysis, data extraction, and the implications of IoT in cybercrime investigations. Cloud Forensics: cloud storage forensics, cloud service provider cooperation, and virtualization technologies. Cryptocurrency &Blockchain Forensics: blockchain forensic tools, tracing cryptocurrency transactions. Network Forensics: packet capture and analysis, intrusion detection systems (IDS), and network log analysis.	6	CO4
5	Major IT Laws related to Cyber Crimes	Definition of IT Act 2000., Important Sections of IT ACT: Section 3, Section 4, Section 5, Section 6, Section 43, Section 65 and 65B, Section 66, 66A, 66B, 66C, 66D, 66E and 66F, Section 67, 67A and 67B, Section 70, Section 71, Section 72	6	CO5

Reference Books:	
1. Leshin, C.B., Internet Investigation in Criminalistics, Prentice Hall, New Jersey, 1997	
2. IT Act (2005)	
3. Incident Response and Computer Forensic by Kelvin Mandia, TMH Publication	
4. Cyber Forensic a Field Manual for Collecting, Examining and Preserving Evidence of Computer Crimes by Albert J Menendez. Auerbach Publications	
5. Digital Forensics: Digital Evidence in Criminal Investigations by Angus McKenzie Marshall	
e-Learning Source:	
1. https://www.youtube.com/live/GAXXQTuHaPk?feature=share	
2. https://youtu.be/QQ9ZLlj36qs	

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																			
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7	
CO1	3	3	3	2	3	2	2	3	3	3	3	2	3	3	3	2	3	3	
CO2	2	3	3	3	3	3	3	3	3	3	3	2	2	3	3	2	2	2	
CO3	3	3	2	2	3	2	3	3	3	2	2	2	2	3	3	3	3	2	
CO4	2	3	3	3	2	3	2	2	2	3	3	3	3	2	3	3	3	3	
CO5	3	2	3	3	2	3	3	3	3	3	3	3	3	3	2	3	2	3	

5- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code		Course Title		Attributes							SDGs No.	
FS414		CYBER FORENSIC		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
				√	√	√			√	√	3,4	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS415	Title of the Course	SPEAKER IDENTIFICATION & VOICE ANALYSIS	L	T	P	C
Year	I	Semester	II	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of the subject is to make the students skillful about the voice analysis and to identify the speaker.						

Course Outcomes	
CO1	Students will be able to understand the organs involved in the human vocal tract.
CO2	After completion of the unit, students will be deeply aware of the mechanism of voice production.
CO3	After completion of the unit, students will be able to understand the parameters for voice analysis.
CO4	After completion of the unit, students will be able to understand the parameters to analyze the sound waves.
CO5	After completion of the unit, students will be aware of the Techniques & Methods of Voice Identification.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction	Introduction, definition, scope, significance, human vocal tract, basic anatomy, human vocal apparatus, vocal cords, supra-laryngeal vocal tract, oral cavity, pharyngeal cavity, nasal cavity, alveolar ridge, epiglottis, glottis soft and hard palate pharynx, larynx, trachea, bronchi, lungs etc.	6	CO1
2	Voice Production	Anatomy of human voice production, Voice production theory, different type of voice production theory, vocal fold and air flow oscillation graph analysis, mechanism of vocal folds tissue during speech production, Speech signals, speech signal processing & pattern recognition, basic factor of sound in speech, acoustic characteristics of speech, speech signals analysis, voice and voicing, tone etc.	6	CO2
3	Parameters for Voice Analysis	Forensic phonetic parameters, acoustic and auditory parameters, traditional and automatic parameters, linguistic and individual variation parameters, quantitative and qualitative parameters, discrete and continuous parameters.	6	CO3
4	Analysis of Sound Waves	Fourier analysis of sound wave, frequency & time domain representation of speech signal, analogue to digital signal and conversion, fast Fourier transform quantization, digitization and speech enhancement, analysis of audio & video signal for authenticity.	6	CO4
5	Techniques & Methods of Voice Identification	Introduction to the technique of pattern recognition and comparison, speaker recognition procedure, method of voice identification, listener method of speaker identification, Instrumental/sound spectrographic method of speaker identification, both classical and computerized approach, analysis of sound spectrogram, sound spectrograph, its working and principle.	6	CO5

Reference Books:	
1.	"Forensic Speaker Identification" by John P. Harrison
2.	"Speaker Classification I: Fundamentals, Features, and Methods" by Douglas A. Reynolds
3.	"Forensic Phonetics" by Keith Johnson
4.	"Forensic Speaker Recognition: Law Enforcement and Counter-Terrorism" edited by Amy Neustein
5.	"Forensic Linguistics: An Introduction to Language in the Justice System" by John Olsson
e-Learning Source:	
1.	https://youtu.be/uVsuZJa-TCs
2.	https://youtu.be/scP7L6rgovk

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	2	3	3	3	3	2	3	2	2	3	3	3	3	3	2	2	2
CO2	2	2	2	2	2	3	3	3	2	3	3	3	2	2	3	2	3	3
CO3	2	3	3	3	3	3	3	3	3	3	2	2	3	2	3	3	3	3
CO4	3	3	3	2	2	3	3	2	3	3	3	2	3	3	3	3	3	3
CO5	3	3	2	3	3	2	2	2	3	2	3	2	2	3	2	3	3	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code		Course Title		Attributes						SDGs No.	
FS415		SPEAKER IDENTIFICATION & VOICE ANALYSIS		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
				√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS416	Title of the Course	DERMATOGLYPHICS & IMPRESSIONS- LAB	L	T	P	C
Year	I	Semester	II	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of this course is to give practical exposure to the students in the different aspects of Dermatoglyphics and impressions. To learn the methods of their detection and examination of different types of impressions (fingerprint, lip print, footprint, ear print etc.)						

Course Outcomes	
CO1	Students will have practical knowledge of the development, lifting, and classification of fingerprints.
CO2	Students will have the practical knowledge of casting and matching of foot and footwear impressions.
CO3	Students will have the practical knowledge of comparing the tyre marks in hit & run cases.
CO4	Students will have the practical knowledge of bite marks examination.
CO5	Students will have the practical knowledge of lip prints and ear prints examination.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction of Fingerprints	1. Print your own 10 Digit Finger Print Card Using Black Ink. 2. Primary and Secondary Classification of Given Finger Print Chart.	6	CO1
2	Development of Fingerprints	3. Location, Development, and Lifting of Latent Finger Print. 4. Comparison of Chance Finger Prints.	6	CO2
3	Examination of Fingerprints	5. Photography of fingerprint.	6	CO3
4	Foot prints	6. Casting and Matching of Foot/Footwear Print on different Surface. 7. Compare the tyre marks/skid marks on mock hit and run case.	6	CO4
5	Lip Prints, Ear Prints and Bite Marks	8. Photography, lifting and preservation of bite marks. 9. Comparison of bite marks. 10. Collection, evaluation and of lip prints. 11. Collection, evaluation and of ear prints.	6	CO5

Reference Books:	
1. J. A., Sukoo, R. J., and Knupfer (2000), "Encyclopedia of Forensic Science", Siegel, Academic Press	
2. Champod, C., Lennard, C. J., Margot, P., & Stoilovic, M. (2017). Fingerprints and other ridge skin impressions. CRC press	
3. Henry C. Lee and R. E. Gaensslen, "Advances in Fingerprint Technology", Second Edition.	
4. Fingerprint Manual, Division of Health Improvement	
5. J.E. Cowger, Friction Ridge Skin, CRC Press, Boca Raton (1983)	
e-Learning Source:	
1. https://youtu.be/Fn5dAM-fKDQ	
2. https://youtu.be/pU_Ap4ZwBrc	

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	2	3	3	3	2	3	3	3	2	2	3	3	3	3	3	3	2	3
CO2	3	3	3	3	2	3	3	3	3	3	3	2	3	2	2	3	2	3
CO3	3	3	3	3	3	3	3	2	2	3	3	2	3	3	3	3	3	3
CO4	3	2	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3	2
CO5	3	2	3	3	3	3	2	3	3	3	3	3	3	2	2	3	3	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code		Course Title		Attributes						SDGs No.	
FS416	DERMATOGLYPHICS & IMPRESSIONS- LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		3,4	
		√	√	√			√	√			



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS417	Title of the Course	QUESTIONED DOCUMENTS- LAB	L	T	P	C
Year	I	Semester	II	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of this course is to give practical exposure to the students in the different aspects of questioned documents, the types of forgery generally encountered. To learn the methods of their detection and examination and handwriting identification.						

Course Outcomes	
CO1	Students will have practical knowledge of the examination of forgeries.
CO2	Students will have practical knowledge of the examination of the typewritten & printed documents.
CO3	Students will have practical knowledge of the ink examination
CO4	Students will have practical knowledge of the counterfeit currency examination.
CO5	Students will have practical knowledge of the examination of handwriting and signature samples.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction of Documents	1. Marking, stamping and Preliminary examination of questioned documents & Standards.	6	CO1
2	Handwriting Examination	2. Examination of sequence of strokes of handwritten samples. 3. Photographic Comparison of Handwriting & Signature	6	CO2
3	Disguised writing and anonymous letters	4. Decipherment of Secret, Erased, Obliterated, Indented Hand Writing Using Instrumental/Physical/Chemical Methods 5. 2. Matching of Hand Writing and Signatures (Genuine/Forged).	6	CO3
4	Examination of Documents	6. Examination of Type Written and Printer Generated document 7. Examination of Questioned Document & Currency 8. 3. Examination of passports, visa, stamp papers, postal stamps	6	CO4
5	Determination of Age of Documents	9. Examination of ink by TLC 10. 2. Examination of seal impression and other mechanical impressions	6	CO5

Reference Books:	
1. Albert, S. Osborn, Questioned Documents, Second Ed., Universal Law Publishing, Delhi, 1998	
2. Charles, C. Thomas, I.S.Q.D. Identification System for Questioned Documents, Billy Prior Bates, Springfield, Illinois, USA, 1971	
3. Hard less, H.R., Disputed Documents, handwriting and thumbs – print identification: profusely illustrated, Low Book Co., Allahabad, 1988	
4. Kurtz, Sheila, Graphotypes a new plant on handwriting analysis, Crown Publishers Inc., USA, 1983.	
5. Wilson, R., Harrison, Suspect Documents – Their Scientific Examination; Universal Law Publishing, Delhi, 1997	
e-Learning Source:	
1. https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==#	
2. https://youtu.be/Is6t1EP_3eg	

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	2	2	3	3	3	3	2	2	3	3	3	3	3	3	3	3	2
CO2	3	3	3	2	2	3	3	3	3	3	2	3	3	2	3	3	2	2
CO3	2	3	3	3	2	3	3	3	3	3	2	3	2	2	3	2	3	3
CO4	3	3	3	3	3	2	2	3	3	2	3	2	2	3	2	3	2	3
CO5	3	3	2	2	3	3	3	3	3	2	3	3	3	3	2	3	2	3

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code		Course Title		Attributes & SDGs						SDGs No.	
				Attributes							
				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.
FS417		QUESTIONED DOCUMENTS- LAB		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS418	Title of the Course	FORENSIC CHEMISTRY & EXPLOSIVE- LAB	L	T	P	C
Year	I	Semester	II	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of this course is to give practical exposure to the students in the different aspects of petroleum products, explosion residue, chemical fertilizers, insecticides, metallic and non-metallic productsetc. Generally encountered. To learn the methods of their detection and examination.						

Course Outcomes	
CO1	Students will have practical knowledge of illicit liquor examination.
CO2	Students will have practical knowledge to separate and identify the volatile liquid.
CO3	Students will have practical knowledge to analyze the black powder.
CO4	Students will have practical knowledge to collect and forwarding the post blast residues.
CO5	Students will have practical knowledge of Interpretation result of explosive residue.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Forensic Chemistry&Beverages	1. Determination of Percentage of Proof Sprit of Ethyl Alcohol in Illicit Liquor. 2. Examination of Country-made Liquor by different methods	6	CO1
2	Examination of petroleum products	3. Separation and Identification of Volatile Liquid by Simple Distillation. 4. Quantitative and qualitative analysis of chemical fertilizers, insecticides, metallic and non-metallic products	6	CO2
3	Explosives	5. Preliminary Examination Black Powder.	6	CO3
4	Explosion Phenomena	6. Collection, preservation, packaging and forwarding Post blast residue.	6	CO4
5	Examination of Explosives	7. To study report of chemical, Instrumental technique and Interpretation result of explosive residue.	6	CO5

Reference Books:	
1.	Richard Saferstein; Forensic Science Hand Book; Ed.; Prentice – Hall, Englewood Cliff, New jersey; (1982)
2.	Dutelle, Aric W. An introduction to crime scene investigation. Jones & Bartlett Publishers, 2011
3.	Tersigni-Tarrant, MariaTeresa A., and Natalie R. Shirley, eds. Forensic anthropology: an introduction. CRC Press, 2012
4.	Coyle, Heather Miller, ed. Forensic botany: principles and applications to criminal casework. CRC Press, 2004
5.	Smith; DGV; A manual of Forensic Entomology Ithaca New York Camstock Univ. Press, USA, (1986)
e-Learning Source:	
1.	https://youtu.be/tLrTITlcsQM
2.	https://youtu.be/p694_czdTMY

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3
CO2	2	3	3	3	2	3	2	3	3	3	3	3	2	3	3	3	2	3
CO3	3	2	3	3	3	2	2	3	2	3	3	2	3	2	3	3	2	3
CO4	3	3	2	2	3	2	3	3	3	3	2	3	3	2	3	3	3	3
CO5	2	3	3	2	3	3	3	3	3	3	3	3	3	3	2	2	3	3

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code		Course Title		Attributes & SDGs						SDGs No.	
				Attributes							
				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.
FS418		FORENSIC CHEMISTRY & EXPLOSIVE- LAB		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS419	Title of the Course	FORENSIC MEDICINE & TOXICOLOGY- LAB	L	T	P	C
Year	I	Semester	II	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of this course is to give practical exposure to the students to identify common plant poisons, extraction and identification of pesticides by color test and TLC, knowledge of medicolegal autopsy, knowledge of relevant cases by case studies etc.						

Course Outcomes	
CO1	Students will have practical knowledge to identify common plant poisons.
CO2	Students will have practical knowledge of extraction and identification of pesticides by color test and TLC.
CO3	Students will have practical knowledge to identify the metallic poisoning.
CO4	Students will have a deep understand and knowledge of relevant cases by case studies.
CO5	Students will have practical knowledge of medicolegal autopsy.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction to Toxicology	1. Identification of Common Plants i.e., Calotropis, Cannabis, Dhatura, Nux-Vomica, 2. Marking Nut, AbrusPrecatorius, Opium Poppy etc. by Physical Examination and Color Test.	6	CO1
2	Instrumental Techniques in Poisoning	2. Extraction and Identification of Insecticides and Pesticides by Color Test/TLC.	6	CO2
3	Examination of Poisons	3. 2. Case study related to poisoning.	6	CO3
4	Forensic Medicine	4. Extraction and Identification of Insecticides and Pesticides by Color Test/TLC.	6	CO4
5	Drug Metabolism	5. Identification of Salts and Metals by Simple Color Test in Case of Metallic Poisoning. 6. Demonstration of different types of injuries. 7. Demonstration of medical autopsy	6	CO5
		8. Extraction and Identification of Drugs/ Toxicants from Biological Matrix and their Detection.	6	CO5

Reference Books:	
1.	Modi, Jaishing P., Textbook of Medical Jurisprudence & Toxicology, M.M. Tripathi Pub., 2001
2.	Mule, S.J. et al., Immunoassays for Drugs subjects to ab, CRC Press USA, 1974
3.	Sunshine, I., Guidelines for Analytical Toxicology Programme, Vol. I, CRC Press, USA, 1950
4.	Sunshine, Methods of Analytical Toxicology, CRC Press USA, 1975
5.	Working Procedure Manual – Toxicology, BPR&D Publication, 2000
e-Learning Source:	
1.	https://youtu.be/eVKO2NV07Eo
2.	https://www.youtube.com/live/fMXXqsZa4Uk?feature=share

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
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CO2	3	2	2	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
CO3	3	2	3	3	3	2	3	3	3	2	3	3	3	3	2	2	2	3
CO4	3	3	3	2	3	3	3	3	3	3	3	3	2	3	3	2	3	3
CO5	2	3	3	3	2	3	3	3	2	3	3	3	3	2	3	3	3	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs									
Course Code	Course Title	Attributes							SDGs No.
FS419	FORENSIC MEDICINE & TOXICOLOGY- LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	FS420	Title of the Course	CYBER FORENSIC- LAB	L	T	P	C
Year	I	Semester	II	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of this course is to give practical exposure to the students in the different aspects of computer and operating systems, Search, collection and seizure of digital evidences at the scene of crime, demonstration of password cracking and e-mail tracking etc.						

Course Outcomes	
CO1	Students will be able to understand the computer and operating systems.
CO2	Students will be able to perform the Search, collection and seizure of digital evidences at the scene of crime
CO3	Students will be able to perform the imaging of hard disk and restoration of deleted files.
CO4	Students will be able to perform the demonstration of password cracking and e-mail tracking.
CO5	Students will be able to perform the detection of origin of e-Mails (IP Address) etc.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction to Cyber Forensic	1. Restoration of deleted files. 2. Demonstration of password cracking	6	CO1
2	Modes & Manner of Cyber Crime	3. Imaging of digital media 4. Demonstration of e-mail tracking 5. Detection of Origin of e-Mails (IP Address) etc.	6	CO2
3	Search and Seizures of Evidence	6. Search, collection and seizure of digital evidences at the scene of crime.	6	CO3
4.	Emerging Trends in Cyber Forensics	7. Introduction to the tools for blockchain analysis. 8. Network log analysis.	6	CO4
5.	Major IT Laws related to Cyber Crimes	9. Case study.	6	CO5

Reference Books:	
1. Leshin, C.B., Internet Investigation in Criminalistics, Prentice Hall, New Jersey, 1997	
2. IT Act (2005)	
3. Incident Response and Computer Forensic by Kelvin Mandia, TMH Publication	
4. Cyber Forensic A Field Manual for Collecting, Examining and Preserving Evidence of Computer Crimes by Albert J Menendez. Auerbach Publications	
5. Digital Forensics: Digital Evidence in Criminal Investigations by Angus McKenzie Marshall	
e-Learning Source:	
1. https://www.youtube.com/live/GAXXQTuhaPk?feature=share	
2. https://youtu.be/QQ9ZLlj36qs	

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
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CO2	2	3	3	3	3	3	3	3	3	3	3	3	2	2	3	2	2	2
CO3	3	3	2	2	3	2	3	3	3	2	2	2	2	3	3	3	3	2
CO4	2	3	3	3	2	3	2	2	2	3	3	3	3	2	3	3	3	3
CO5	3	2	3	3	2	3	3	3	3	3	3	3	3	3	2	3	2	3

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs									
Course Code	Course Title	Attributes							SDGs No.
FS420	CYBER FORENSIC-LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√			√	√	3,4