



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

**DEPARTMENT OF PARAMEDICAL SCIENCES**

**BACHELOR OF SCIENCE IN FORENSIC SCIENCE**  
**(B.FS.)**

**SYLLABUS**

**YEAR/ SEMESTER: III/V**



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

Program: B.Sc. FS

Semester-V

S. N.	Course code	Course Title	Type of Paper	Period Per hr/week/sem			Evaluation Scheme				Sub. Total	Credit	Total Credits
				L	T	P	CT	TA	Total	ESE			
<b>THEORIES</b>													
1	FS301	Forensic Toxicology	Core	3	1	0	40	20	60	40	100	3:1:0	4
2	FS302	Forensic Ballistics	Core	3	1	0	40	20	60	40	100	3:1:0	4
3	FS303	Digital & Cyber Forensics-II	Core	3	1	0	40	20	60	40	100	3:1:0	4
4	FS304	Research Methodology	Core	3	1	0	40	20	60	40	100	3:1:0	4
<b>PRACTICAL</b>													
1	FS305	Forensic Toxicology-Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
2	FS306	Forensic Ballistics-Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3	FS307	Digital & CyberForensics-II-Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
4	FS308	Seminar	Core	0	4	0	50	50	100	00	100	0:0:4	4
<b>Total</b>				<b>12</b>	<b>08</b>	<b>06</b>	<b>330</b>	<b>190</b>	<b>520</b>	<b>280</b>	<b>800</b>	<b>23</b>	<b>23</b>

S. N.	Course code	Course Title	Type of Paper	Attributes							United Nation Sustainable Development Goal (SDGs)
				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
<b>THEORIES</b>											
1	FS301	Forensic Toxicology	Core	√	√	√			√	√	3,4
2	FS302	Forensic Ballistics	Core	√	√	√			√	√	3,4
3	FS303	Digital & Cyber Forensics-II	Core	√	√	√			√	√	3,4
4	FS304	Research Methodology	Core	√	√	√			√	√	3,4
<b>PRACTICAL</b>											
1	FS305	Forensic Toxicology-Lab	Core	√	√	√			√	√	3,4
2	FS306	Forensic Ballistics-Lab	Core	√	√	√			√	√	3,4
3	FS307	Digital & Cyber Forensics-II-Lab	Core	√	√	√			√	√	3,4
4	FS308	Seminar	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

<b>Effective from Session: 2021-22</b>							
<b>Course Code</b>	<b>FS301</b>	<b>Title of the Course</b>	<b>FORENSIC TOXICOLOGY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>III</b>	<b>Semester</b>	<b>V</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>
<b>Pre-Requisite</b>	<b>Nil</b>	<b>Co-requisite</b>	<b>Nil</b>				
<b>Course Objectives</b>	Provide understanding about the different types of poisons & toxicological evidences, their forensic significances and importance of proper examination.						

Course Outcomes	
<b>CO1</b>	To develop the basic understanding and knowledge of historical perspective and background of toxicology and toxicological examination. Introduction and classification of drugs of abuse.
<b>CO2</b>	Developing the understanding of classification, administration and action of poison and their identification techniques
<b>CO3</b>	To discuss about the classification, nature, administration, symptoms, detection, Post mortem finding of organic and inorganic poisons.
<b>CO4</b>	To discuss about the classification, nature, administration, symptoms, detection, Post mortem finding of Vegetable poison, Pesticides etc.
<b>CO5</b>	To discuss about the different techniques and tests for the detection, extraction of poisons from biological matrices and medico-legal aspects of poisoning.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>INTRODUCTION TO TOXICOLOGY &amp; DRUGS OF ABUSE</b>	<b>Toxicology:</b> Introduction, concept and history, forensic toxicological examination and its significance. <b>Drugs of abuse:</b> Introduction, classification of drugs of abuse, drug of abuse in sports, narcotics drugs, and psychotropic substances, designers' drug and their forensic examination, Drugs and Cosmetic Act, Excise Act, NDPS Act.	8	CO1
2	<b>POISON</b>	<b>Poison-</b> Administration, action of poison, classification of poisoning, types of poisons, collection, isolation, sign and symptoms of poisoning, mode of action and its effect on vital functions, classical identification techniques, modern technique Chromatography, mass Spectroscopy, spectrophotometry, x-ray diffraction.	8	CO2
3	<b>ORGANIC &amp; INORGANIC POISON</b>	Organic Poisons, Inorganic Poisons, Synthetic poisons, Individual Poison (Barbiturate, Arsenic, Organo phosphorus Compound)-classification, nature, administration, symptoms, detection, Post mortem finding, estimation, toxicological material.	8	CO3
4	<b>VEGETABLE POISON</b>	1. Vegetable poison- Dhatura, oleander, madar (Aak, Akdo) Nature, use, system, fatal dose, fatal period, Post mortem finding, isolation, detection, estimation. Pesticides, Natural organic insecticides: pyrethroids and pyrethrin, Corrosive poisons, Poisonous gases- classification, nature, administration, symptoms, detection, Post mortem finding, estimation, toxicological material.	8	CO4
5	<b>TOXICOLOGICAL ANALYSIS</b>	Features of toxicological analysis, Tests for the detection of poisons, Extraction of poisons, Extraction of poisons from biological matrices. Medico-legal aspects of poisoning.	8	CO5

### Reference Books:

1. Stolemen, Progress in Chemical Toxicology: Acad. Press, New York, 1963.
2. Clark, E.G.C., Isolation and identification of Drugs, Vol. I and Vol. II, Academic Press, 1986.
3. Connors., A test book of pharmaceuticals analysis, Inter science, New York, 1975.
4. Cravey, R.H., Baselt, R.C., Introduction to Forensic Toxicology, Biochemical publications, Davis C A, 1981.
5. Curry A.S., Analytical Methods in Human Toxicology, Part-II, 1986.
6. Modi, Jaising P., Textbook of Medical Jurisprudence & Toxicology, M.M. Tripathi Pub., 2001.
7. Mule, S.J. et al., Immunoassays for Drugs subjects to ab, CRC Press USA, 1974.
8. Sunshine, I., Guidelines for Analytical Toxicology Programs, Vol. I, CRC Press, USA, 1950.
9. Sunshine, I., Guidelines for Analytical Toxicology, CRC Press USA, 1975.
10. Sunshine, Methods of Analytical Toxicology, CRC Press USA, 1975.

### e-Learning Source:

1. <https://youtu.be/wytDunVxNx0>
2. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==#>
3. <https://youtu.be/aTfVwV0vzg>

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

PO-PSO CO	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
<b>CO1</b>	3	3	3	2	3	2	3	3	3	2	3	2	3	3	2	3	3	3
<b>CO2</b>	3	3	2	3	3	2	3	3	3	2	3	3	2	3	2	3	3	3
<b>CO3</b>	3	2	3	3	3	3	2	3	3	3	2	2	3	2	3	3	2	3
<b>CO4</b>	3	3	2	3	2	3	3	3	2	3	3	2	2	3	3	3	3	3
<b>CO5</b>	2	3	2	3	3	3	3	2	3	3	2	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.	
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
FS301	FORENSIC TOXICOLOGY	√	√	√				√	√	3,4



## Integral University, Lucknow

<b>Effective from Session: 2021-22</b>							
<b>Course Code</b>	<b>FS302</b>	<b>Title of the Course</b>	<b>FORENSIC BALLISTICS</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>III</b>	<b>Semester</b>	<b>V</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>
<b>Pre-Requisite</b>		<b>Co-requisite</b>	<b>Nil</b>				
<b>Course Objectives</b>	To develop an understanding about the firearms and ammunition as well as their forensic examination.						

Course Outcomes	
<b>CO1</b>	To develop the deep understanding and knowledge of historical perspective and background of firearms and their development. Components and types of firearms.
<b>CO2</b>	Developing the understanding of history and classification of ammunition, constructional features of different types of cartridges, types of primers and priming composition, propellants and their compositions, various types of bullet and compositional aspects.
<b>CO3</b>	To discuss about the various aspects of Internal and External Ballistics in detail.
<b>CO4</b>	To develop the deep understanding about the terminal ballistics in brief and its importance in criminal investigation.
<b>CO5</b>	To discuss about the principles of identification of firearms and determination of range of fire.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>HISTORY AND BACKGROUND OF FIREARMS</b>	Their classification and characteristics, various component of small arms, smooth bore and class characteristics, purpose of rifling, types of rifling trigger and firing mechanism, improvised/country-made/imitative fire arm and their constructional features.	8	CO1
2	<b>AMMUNITION</b>	Definition, History and Classification, constructional features of different types of cartridges, types of primers and priming composition, propellants and their compositions, various types of bullet and compositional aspects.	8	CO2
3	<b>INTERNAL AND EXTERNAL BALLISTICS</b>	Definition, ignition of propellant, shape and size of propellant, manner of burning, various factors affecting the internal ballistics: lock time, ignition time, barrel time, erosion, corrosion and gas cutting. Equation of motion of projectile, principal problems of exterior ballistics, vacuum trajectory, effect of air resistance on trajectory, base drag, yaw, shape of projectile and stability.	8	CO3
4	<b>TERMINAL BALLISTICS</b>	Effect of projectile on hitting target: function of bullet shape, striking velocity, striking angle and nature of target, tumbling of bullet, effect of intermediate targets Ricochet and wound ballistics, evaluation of injuries caused due to shot-gun, rifle, handguns and country made fire arms, post-mortem and anti-mortem firearm injuries.	8	CO4
5	<b>PRINCIPLES AND PRACTICE OF IDENTIFICATION</b>	Firearms, ammunition and their components, different types of marks produced during firing process on cartridge- firing pin marks, breech face marks, chamber marks, extractor and ejector marks, number /direction of land and grooves, striation marks on land and grooves. Determination of range of fire- burning, scorching, blackening, tattooing and metal fouling, shot dispersion and GSR distribution.	8	CO5

<b>Reference Books:</b>	
1.	Sharma, B.R.; Firearms in Criminal Investigation & Trials, 4th Ed, Universal Law Publishing Co Pvt Ltd, New Delhi, 2011
2.	Hogg, I.V; "The Cartridge guide – A Small arms Ammunition Identification Manual", The Stackpole publishing Co., Harrisburg, Pa, 1982
3.	Hatcher, Jury and Weller; "Firearms Investigation, Identification and Evidence", Stackpole Books, Harrisburg, Pa, 1997.
4.	Jauhari M; "Identification of Firearms, Ammunition, & Firearms Injuries", BPR&D, New Delhi.
5.	Schooeble, A.J. and Exline, L.D; Current methods in Forensic Gunshot Residue Analysis, CRC Press, New York, 2000.
6.	W.G. Eckert and R.K. Wright in Introduction to Forensic Sciences, 2nd Edition, W.G. Eckert (ED.), CRC Press, Boca Raton (1997).
<b>e-Learning Source:</b>	
1.	<a href="https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjv3c0vICLa6VYg==#">https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjv3c0vICLa6VYg==#</a>
2.	<a href="https://youtu.be/Yu8d-Ct53wc">https://youtu.be/Yu8d-Ct53wc</a>
3.	<a href="https://youtu.be/K5PMnGO-8AY">https://youtu.be/K5PMnGO-8AY</a>

PO-PSO CO	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
<b>CO1</b>	2	3	2	2	3	2	3	3	3	2	3	2	3	3	2	3	2	2
<b>CO2</b>	2	3	2	3	3	2	3	2	3	2	3	3	2	3	2	3	3	2
<b>CO3</b>	3	2	3	3	2	2	3	2	3	3	2	2	3	2	2	2	2	3
<b>CO4</b>	3	3	2	3	2	3	3	3	2	3	3	2	2	3	3	3	3	3
<b>CO5</b>	3	3	2	3	2	3	3	2	3	3	2	3	3	2	3	3	3	3

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

		Attributes & SDGs							SDGs No.
Course Code	Course Title	Attributes							
FS302	FORENSIC BALLISTICS	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



**Integral University, Lucknow**

<b>Effective from Session: 2021-22</b>							
<b>Course Code</b>	<b>FS303</b>	<b>Title of the Course</b>	<b>DIGITAL &amp; CYBER FORENSICS-II</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>II</b>	<b>Semester</b>	<b>III</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>
<b>Pre-Requisite</b>	<b>Nil</b>	<b>Co-requisite</b>	<b>Nil</b>				

**Course Objectives** Able to understand the importance of cyber forensics in corporate and electronic world with emphasis on forensic auditing and IT Act.

<b>Course Outcomes:</b> After the successful course completion, learners will develop following attributes:	
<b>CO1</b>	To develop the understanding and knowledge about the Data and Evidence Recovery, Data Recovery Tools, Data Recovery Procedures and Ethic.
<b>CO2</b>	Developing the understanding of various aspects of Forensics Auditing, Principles of Forensic Accounting and Fraud Examination and Roles of the Forensic Accountant.
<b>CO3</b>	To discuss about the Investigation of Theft Acts, Investigation of Concealment and Conversion Investigation Methods.
<b>CO4</b>	To develop the deep understanding about the EDI, E-Business, E-Banking, Online payment modes, Mobile Banking Ecommerce, Internet and intranets.
<b>CO5</b>	Scope and Objectives of IT Act 2000. Recognition and Verification of Digital Signature, and Emerging trends in Information Technology law.

<b>Unit No.</b>	<b>Title of the Unit</b>	<b>Content of Unit</b>	<b>Contact Hrs.</b>	<b>Mapped CO</b>
1	<b>DATA AND EVIDENCE RECOVERY</b>	<b>Data and Evidence Recovery</b> –Computer and cyber forensic basics, Mobile Forensics, Blue-Tooth, Computer Ethics. Data and Evidence Recovery, Data Recovery Tools, Data Recovery Procedures and Ethics, File Transfer Protocol (FTP), Document a "Chain of Custody", Complete time line analysis of computer files based on file creation, file modification and file access, Recover Internet Usage Data, Recover Swap Files/Temporary Files/Cache Files.	8	CO1
2	<b>FORENSICS AUDITING</b>	<b>Forensics Auditing</b> - step-by-step process for securing, investigating, and auditing or assessing various IT environments. Introduction to Forensic Accounting and Fraud Examination; Principles of Forensic Accounting and Fraud Examination; Roles of the Forensic Accountant; Nature of Fraud, Fraud Prevention and Detection, Recognizing the Symptoms of Fraud.	8	CO2
3	<b>INVESTIGATING THEFT ACTS</b>	<b>Investigating Theft Acts;</b> Investigating Concealment, Conversion Investigation Methods; Private Sources of Information, Inquiry Methods and Fraud Reports, Honesty Testing, The Fraud Reports, Management of Fraud; Financial Statement Fraud; Revenue-and Inventory-Related Financial Statement Frauds; Liability, Asset, and Inadequate Disclosure Frauds; Fraud Against Organizations, Consumer Fraud; Identification of Theft, Investment Scams, Money Laundering; Bankruptcy, Divorce, and Tax Fraud, Fraud in E-Commerce; Resolution of Fraud, Legal Follow-Up, Being an Expert Witness; Financial Statement Fraud Standards; Avoiding common mistakes in fraud risk assessment and examination; Credit Card Frauds, Online Transaction Frauds, Cheque Frauds etc.	8	CO3
4	<b>ELECTRONIC WORLD</b>	Electronic World – Introduction, EDI, E-Business, E-Banking, Online payment modes, Mobile Banking E-commerce: Concerns for Ecommerce Growth, Concepts Electronic Communication, PCs and Networking, E-mail, Internet and intranets. EDI, EDI to E-commerce, UN/EDIFACT Concerns for E-commerce Growth, Internet band width, Technical, Security and Legal issues, Business Electronic Commerce providers.	8	CO4
5	<b>INFORMATION TECHNOLOGY LAW</b>	Information technology law: IT Act 2000: Scope, Objectives, E- Governance, Creation, Recognition and Verification of Digital Signature Digital Signature and Penalties under IT Act 2000, Certifying Authority and Controller. Emerging trends in Information Technology law.	8	CO5

**Reference Books:**

1. File System Forensic Analysis by Brian Carrier, Publisher: Addison-Wesley Professional, 1st Edition (2005).
2. Cyberlaw Crimes (IT Act 2000 & Computer Crime Analysis) by Barkha & Ram Mohan, Publisher: Asian Law House, Hyderabad.
3. Firewalls and Internet Security: Repelling the Wily Hacker, Second Edition (2003) Addison.
4. E-Commerce: The Cutting Edge of Business by Kamlesh K. Bajaj & Debjani Nag, Tata McGraw Hill 2nd Edition, 2005
5. Cyber Law and E. Commerce by David Baumer, JC Poindexter, TMG Cyber law Simplified Vivek Sood, TMG

**e-Learning Source:**

1. <https://youtu.be/EkZSfGGROZQ>
2. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjv3c0vICLa6VYg==#>
3. <https://youtu.be/vErX76YoHVs>

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

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

**Attributes & SDGs**

<b>Course Code</b>	<b>Course Title</b>	<b>Attributes</b>							<b>SDGs No.</b>
		<b>Employability</b>	<b>Entrepreneurship</b>	<b>Skill Development</b>	<b>Gender Equality</b>	<b>Environment &amp; Sustainability</b>	<b>Human Value</b>	<b>Professional Ethics</b>	
FS303	DIGITAL & CYBER FORENSICS-II	√	√	√			√	√	<b>3,4</b>



## Integral University, Lucknow

<b>Effective from Session:</b> 2021-22							
<b>Course Code</b>	<b>FS304</b>	<b>Title of the Course</b>	<b>RESEARCH METHODOLOGY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>III</b>	<b>Semester</b>	<b>V</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>
<b>Pre-Requisite</b>	<b>Nil</b>	<b>Co-requisite</b>	<b>Nil</b>				
<b>Course Objectives</b>	The primary objective of this course is to develop a research orientation among the scholars and to acquaint them with the fundamentals of research methods. Specifically, the course aims at introducing them to the basic concepts used in research and to scientific social research methods and their approach. It includes discussions on sampling techniques, research designs and techniques of analysis.						

Course Outcomes	
<b>CO1</b>	To develop the basic introduction and process of research along with ethical issues in conducting research.
<b>CO2</b>	Developing the understanding of Research modeling and Data collection methods.
<b>CO3</b>	To discuss about the Application of Statistical tool and their dimensions in good research.
<b>CO4</b>	To develop a basic understanding about the data analysis techniques and hypothesis testing.
<b>CO5</b>	To develop the basic knowledge and skill of report writing and APA formatting of research among the students.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>INTRODUCTION</b>	Introduction-Definitions and types of research; Research process and steps in conducting research; Applications of Research. Ethical issues in conducting research.	8	CO1
2	<b>RESEARCH MODELING</b>	Research Modeling- Types of Data, Data collection methods- Survey method, Observation method, Experimentation; Scaling techniques; types of sampling, steps in sampling, advantage and limitations of sampling.	8	CO2
3	<b>APPLICATION OF STATISTICAL TOOLS</b>	Application of Statistical tools -Measures of Central tendency – Mean, Median, Mode; Introduction of Probability Theories and Concepts, Probability Distributions-Discrete and Continuous Probability Distributions; Measures of Association: Correlation and regression.	8	CO3
4	<b>DATA ANALYSIS TECHNIQUES</b>	Data Analysis Techniques—Quantitative and qualitative methods of data analysis; Hypothesis Testing-Parametric tests (Z-test, t-test-test) and Non-parametric Tests (Chi- Square Test, ANNOVA), Tests of significance based on normal distributions; association of attributes.	8	CO4
5	<b>REPORT WRITING</b>	Data Analysis Techniques—Quantitative and qualitative methods of data analysis; Hypothesis Testing-Parametric tests(Z-test,t-test,F-test)andNon-parametricTests(Chi Square Test, ANNOVA), Tests of significance based on normal distributions; association of attributes.	8	CO5

**Reference Books:**

1. Mausner & Bahn: Epidemiology-An Introductory text, 2ndEd., (1985) W.B. Saunders Co.
2. Richard F. Morton & J. Richard Hebd: A study guide to Epidemiology and Biostatistics, 2<sup>nd</sup> Ed. (2012), University Park Press, Baltimore.
3. B.K. Mahajan, Methods in Biostatistics, Jaypee.
4. Hicks: Research methodology, Churchill Livingstone.
5. Introduction to research methods by Bora Pajo.
6. Research methodology by Ranjit Kumar.

**e-Learning Source:**

1. <https://youtu.be/wBomUBY62a4>
2. <https://youtu.be/8L4lupxljog>
3. <https://youtu.be/unsFK23vJjk>

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
	<b>CO1</b>	2	2	3	2	3	2	2	2	2	2	3	2	3	3	2	3
<b>CO2</b>	2	2	2	3	3	2	3	2	3	2	3	3	2	2	2	3	3
<b>CO3</b>	3	2	3	3	2	2	3	2	3	3	2	2	3	2	2	2	2
<b>CO4</b>	2	3	2	3	2	2	2	2	2	3	3	2	2	3	2	2	3
<b>CO5</b>	3	3	2	3	2	3	3	2	3	2	2	3	3	2	3	3	3

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

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
<b>FS304</b>	<b>RESEARCH METHODOLOGY</b>	√	√	√	√		√	√	<b>3,4</b>



## Integral University, Lucknow

<b>Effective from Session: 2021-22</b>							
<b>Course Code</b>	<b>FS305</b>	<b>Title of the Course</b>	<b>FORENSIC TOXICOLOGY-LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>III</b>	<b>Semester</b>	<b>V</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>
<b>Pre-Requisite</b>	<b>Nil</b>	<b>Co-requisite</b>	<b>Nil</b>				
<b>Course Objectives</b>	To provide a detailed practical knowledge of forensic toxicology in criminal investigation.						

Course Outcomes	
<b>CO1</b>	To perform the analysis of plant poison
<b>CO2</b>	To perform the identification of poisons by color test
<b>CO3</b>	To identify the different organic poisons
<b>CO4</b>	To extract the drugs and poisons using various methods
<b>CO5</b>	To separate drugs of abuse by thin layer chromatography

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>INTRODUCTION TO TOXICOLOGY &amp; DRUGS OF ABUSE POISON ORGANIC &amp; INORGANIC POISON VEGETABLE POISON TOXICOLOGICAL ANALYSIS</b>	Microscopic examination of Plant poisons	30 hrs.	CO1-5
2		Color Tests for identification of poisons, drugs.		
3		To identify metallic poisons.		
4		To identify organic poisons.		
5		Extraction methods of drugs, Poisons.		
6		To identify drugs of abuse by spot tests.		
7		To perform color tests for barbiturates.		
8		To separate drugs of abuse by thin layer chromatography		

<b>Reference Books:</b>																	
1. Modi, Jaising 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 Programs, Vol. I, CRC Press, USA,1950.																	
4. Clark, E.G.C., Isolation and identification of Drugs, Vol. I and Vol. II, Academic Press, 1986.																	
<b>e-Learning Source:</b>																	
1. <a href="https://youtu.be/0ugmuJ0mS60">https://youtu.be/0ugmuJ0mS60</a>																	
2. <a href="https://youtu.be/FP4QJ1M6T1c">https://youtu.be/FP4QJ1M6T1c</a>																	
3. <a href="https://youtu.be/QtanM5-mD7M">https://youtu.be/QtanM5-mD7M</a>																	

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
<b>CO1</b>	3	3	3	2	3	2	3	3	3	2	3	2	3	3	2	3	3
<b>CO2</b>	3	3	2	3	3	2	3	3	3	2	3	3	2	3	2	3	3
<b>CO3</b>	3	2	3	3	3	3	2	3	3	3	2	2	3	2	3	3	2
<b>CO4</b>	3	3	2	3	2	3	3	3	2	3	3	2	2	3	3	3	3
<b>CO5</b>	2	3	2	3	3	3	3	2	3	3	2	3	3	2	3	3	3

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

Course Code	Course Title	Attributes							SDGs No.	
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
FS305	FORENSIC TOXICOLOGY-LAB	√	√	√				√	√	3,4





**Integral University, Lucknow**

<b>Effective from Session: 2021-22</b>							
<b>Course Code</b>	<b>FS306</b>	<b>Title of the Course</b>	<b>FORENSIC BALLISTICS-LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>III</b>	<b>Semester</b>	<b>V</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>
<b>Pre-Requisite</b>	<b>Nil</b>	<b>Co-requisite</b>	<b>Nil</b>				
<b>Course Objectives</b>	To provide a detailed practical knowledge of forensic ballistics in criminal investigation.						

<b>Course Outcomes:</b> After the successful course completion, learners will develop following attributes:	
<b>CO1</b>	To understand different types of firearms and their working mechanism
<b>CO2</b>	To identify different types of marks of fired cartridge case
<b>CO3</b>	Range estimation of fired bullet
<b>CO4</b>	Discuss about the firearm injuries
<b>CO5</b>	To analyze the GSR found on crime scene

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>HISTORY AND BACKGROUND OF FIREARMS AMMUNITION INTERNAL AND EXTERNAL BALLISTICS TERMINAL BALLISTICS PRINCIPLES AND PRACTICE OF IDENTIFICATION</b>	Demonstration of Firearms- Rifle, Handguns (standard & Country made), Shot gun	30 hrs.	CO1-5
2		To identify different types of marks on fired cartridge.		
3		To co-relate the striking angle of the bullet with the impact on the target.		
4		To estimate the range of fired bullets.		
5		To identify gunshot residue.		
6		To correlate the nature of injuries with distance from which the bullet was fired.		
7		To differentiate, with the aid of diagram, contact wounds, close range wounds and distant wounds.		

<b>Reference Books:</b>	
1.	Sharma, B.R.; Firearms in Criminal Investigation & Trials, 4th Ed, Universal Law Publishing Co Pvt Ltd, New Delhi, 2011
2.	Hogg, I.V; "The Cartridge guide – A Small arms Ammunition Identification Manual", The Stackpole publishing Co., Harrisburg, Pa, 1982
3.	Hatcher, Jury and Weller; "Firearms Investigation, Identification and Evidence", Stackpole Books, Harrisburg, Pa, 1997.
4.	Jauhari M; "Identification of Firearms, Ammunition, & Firearms Injuries", BPR&D, New Delhi.
<b>e-Learning Source:</b>	
1.	<a href="https://youtu.be/JjtT4zrQnzw">https://youtu.be/JjtT4zrQnzw</a>
2.	<a href="https://youtu.be/EjQrhDKDWFk">https://youtu.be/EjQrhDKDWFk</a>
3.	<a href="https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==#">https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==#</a>

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

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

Course Code	Course Title	Attributes							SDGs No.
FS306	FORENSIC BALLISTICS-LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√	√		√	√	



**Integral University, Lucknow**

<b>Effective from Session: 2019-20</b>							
<b>Course Code</b>	<b>FS307</b>	<b>Title of the Course</b>	<b>DIGITAL &amp; CYBER FORENSICS-II-LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>III</b>	<b>Semester</b>	<b>V</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>
<b>Pre-Requisite</b>	<b>Nil</b>	<b>Co-requisite</b>	<b>Nil</b>				
<b>Course Objectives</b>	To provide a detailed practical knowledge of digital & cyber forensic in criminal investigation.						

<b>Course Outcomes</b>	
<b>CO1</b>	To perform the data recovery
<b>CO2</b>	Creation of digital evidences
<b>CO3</b>	
<b>CO4</b>	
<b>CO5</b>	

<b>Unit No.</b>	<b>Title of the Unit</b>	<b>Content of Unit</b>	<b>Contact Hrs.</b>	<b>Mapped CO</b>
1	<b>DATA AND EVIDENCE RECOVERY FORENSICS AUDITING INVESTIGATING THEFT ACTS ELECTRONIC WORLD INFORMATION TECHNOLOGY LAW</b>	Data Recovery integrated with forensic technology.	30 hrs.	CO1-5
2		Access Data e Discovery.		
3		Creation & verification of Digital Signature.		
4		Network Analysis.		
5		Detail Analysis of E-mail, E-Mail Investigation, E-Mail Tracking, IP Tracking, Email Recovery.		
6		Working on Encase Software.		
7		Imaging of discs using various tools.		
8		Image processing using tools like, Photoshop, Corel Photo paint etc.		

<b>Reference Books:</b>	
1. File System Forensic Analysis by Brian Carrier, Publisher: Addison-Wesley Professional, Ist Edition (2005).	
2. Cyberlaw Crimes (ITAct2000&ComputerCrimeAnalysis) by Barkha & Ram Mohan, Publisher: Asian Law House, Hyderabad.	
3. Firewalls and Internet Security: Repelling the Wily Hacker, Second Edition (2003) Addison.	
<b>e-Learning Source:</b>	
1. <a href="https://youtu.be/EkZSfGGROZO">https://youtu.be/EkZSfGGROZO</a>	
2. <a href="https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==#">https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==#</a>	
3. <a href="https://youtu.be/vErX76YoHVv">https://youtu.be/vErX76YoHVv</a>	

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

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

<b>Attributes &amp; SDGs</b>									
<b>Course Code</b>	<b>Course Title</b>	<b>Attributes</b>							<b>SDGs No.</b>
FS307	DIGITAL & CYBER FORENSICS-II-LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



## Integral University, Lucknow

<b>Effective from Session: 2021-22</b>										
<b>Course Code</b>	<b>FS308</b>	<b>Title of the Course</b>	<b>SEMINAR ON</b>				<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>III</b>	<b>Semester</b>	<b>VI</b>				<b>0</b>	<b>4</b>	<b>0</b>	<b>4</b>
<b>Pre-Requisite</b>	Nil	<b>Co-requisite</b>	Nil							
<b>Course Objectives</b>	This course will serve as a platform for students to integrate various components of patient management and debate contentious issues in the efficacy of Physiotherapy techniques used in musculoskeletal, neurological, cardiopulmonary, & Sports rehabilitation as well as enhance presentation skills.									

Course Outcomes	
<b>CO1</b>	The students will understand and interpret latest advancements through different technical papers, reports, Journals, Data sheets, books etc
<b>CO2</b>	The students will inculcate the skills for literature survey and will learn to manage resources effectively.
<b>CO3</b>	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 presentations on an assigned topic.
<b>CO4</b>	The students will be able to communicate his/her ideas with his peers as audience, which will enhance both oral and written communication skills.
<b>CO5</b>	The students will be able to create interest to pursue lifelong learning.

### SEMINAR PRESENTATION ASSESSMENT FORM

<b>Name of Student:</b>		<b>Session:</b>	
<b>Enrolment Number:</b>		<b>Date:</b>	
<b>Name of Subject:</b>	Seminar on Clinical Issues	<b>Subject code:</b>	PT408
<b>Topics:</b>			

Criteria	Sub-Criteria	Max. Marks	Marks Obtained
Introduction (Max marks-05)	Use appropriate background information	<b>02</b>	
	Has clear statement of purpose	<b>02</b>	
	Shows a logical sequence	<b>01</b>	
Factual Content (Max marks- 10)	Includes accurate information	<b>02</b>	
	Shows up-to-date content	<b>02</b>	
	Presents relevant content	<b>02</b>	
	Shows in-depth and sufficient details	<b>01</b>	
	Addresses all important issues	<b>01</b>	
	Is selective	<b>01</b>	
	Use of proper English Grammar in the text	<b>01</b>	
Presentation Quality (Max marks-03)	Has a good design of presentation (appropriate font, type, size, color, matter per slide etc.)	<b>02</b>	
	Has a clear verbal expression and eye contact with audience	<b>01</b>	
Response to questions (Max marks-05)	Answers question(s) correctly	<b>02</b>	
	Has the ability to think on the spot	<b>02</b>	
	Shows an ability to defend content of presentation	<b>01</b>	
Time Management (Max. mark-02)	Completes the presentation within allocated time	<b>02</b>	
<b>Total Marks</b>		<b>25</b>	

**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 25 marks.

**Comments/Suggestions:**

(Name and signature of Incharge)

(Head, Physiotherapy)

### EVALUATION OF SEMINAR ON CLINICAL ISSUES

BFS- Students has to prepare minimum 2 long case and 2 short cases during their seminar presentation during due course of time. The evaluation for internal clinical examination of 50 marks will be distributed:

Seminar Presentation=**25marks**.

Viva voce =**20 marks**

Attendance=**5 marks**

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	2	3	3	2	3	2	3	1	2	1	-	-	3	2	3	3	2
<b>CO2</b>	3	3	3	3	2	2	3	2	1	3	-	-	2	2	3	2	3
<b>CO3</b>	3	3	3	3	2	2	3	2	1	3	-	-	3	2	2	2	3
<b>CO4</b>	3	3	3	3	2	2	3	2	1	3	-	-	2	3	2	2	3
<b>CO5</b>	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.	
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
<b>FS308</b>	<b>SEMINAR</b>	√	√	√				√	√	<b>3,4,9, 17</b>



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

**DEPARTMENT OF PARAMEDICAL SCIENCES**

**BACHELOR OF SCIENCE IN FORENSIC SCIENCE**  
**(B.F.S.)**

**SYLLABUS**

**YEAR/ SEMESTER: III/VI**





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

Program: B.Sc. FS

Semester-VI

S. N.	Course code	Course Title	Type of Paper	Period Per hr/week/sem			Evaluation Scheme				Sub. Total	Credit	Total Credits
				L	T	P	CT	TA	Total	ESE			
<b>THEORIES</b>													
1	FS309	Questioned Document Examination	Core	3	1	0	40	20	60	40	100	3:1:0	4
2	FS310	Explosives	Core	2	1	0	40	20	60	40	100	3:1:0	3
3	FS311	Fingerprints & Impressions	Core	3	1	0	40	20	60	40	100	3:1:0	4
4	FS312	Instrumental and Analytical Technique	Core	3	1	0	40	20	60	40	100	2:1:0	4
<b>PRACTICAL</b>													
1	FS313	Questioned Document Examination-Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
2	FS314	Fingerprints & Impressions-Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3	FS315	Project Work/Dissertation	Core	0	10	0	50	50	100	00	100	0:0:10	10
<b>Total</b>				<b>11</b>	<b>04</b>	<b>04</b>	<b>290</b>	<b>170</b>	<b>460</b>	<b>240</b>	<b>700</b>	<b>27</b>	<b>27</b>

S. N.	Course code	Course Title	Type of Paper	Attributes							United Nation Sustainable Development Goal (SDGs)
				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
<b>THEORIES</b>											
1	FS309	Questioned Document Examination	Core	√	√	√			√	√	3,4
2	FS310	Explosives	Core	√	√	√			√	√	3,4
3	FS311	Fingerprints & Impressions	Core	√	√	√			√	√	3,4
4	FS312	Instrumental and Analytical Technique	Core	√	√	√			√	√	3,4
<b>PRACTICAL</b>											
1	FS313	Questioned Document Examination-Lab	Core	√	√	√			√	√	3,4
2	FS314	Fingerprints & Impressions-Lab	Core	√	√	√			√	√	3,4
3	FS315	Project Work/Dissertation	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

<b>Effective from Session: 2021-22</b>							
<b>Course Code</b>	<b>FS309</b>	<b>Title of the Course</b>	<b>QUESTIONED DOCUMENT EXAMINATION</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>III</b>	<b>Semester</b>	<b>VI</b>	3	1	0	4
<b>Pre-Requisite</b>	<b>Nil</b>	<b>Co-requisite</b>	<b>Nil</b>				
<b>Course Objectives</b>	To develop the skills of forensic examination of questioned documents and forgeries.						

Course Outcomes	
<b>CO1</b>	To develop the understanding and knowledge about basics concepts of questioned documents examination, preliminary examination of questioned documents and basic tools needed for forensic examination of documents.
<b>CO2</b>	Developing the understanding to estimate the age of the documents and study of typescripts and typewriters.
<b>CO3</b>	To discuss about the basic principles of handwriting identification and development of handwriting.
<b>CO4</b>	To develop the understanding about the forgeries and their types.
<b>CO5</b>	To discuss about the analysis of charred documents and their examination, examination of counterfeit Indian currency notes, passports, visas and stamp papers.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>INTRODUCTION TO QUESTIONED DOCUMENTS</b>	Definition, types of questioned documents. Handling, care, preservation and marking of Questioned Documents, Preliminary examination of questioned documents. Basic tools needed for forensic documents.	8	CO1
2	<b>ANALYSIS OF QUESTIONED DOCUMENTS</b>	Determining the age and relative age of documents. Analysis and Comparison of paper and ink. Different types of printers and analysis of printed documents. Study of typescripts and typewriter characteristics and analysis of typed documents.	8	CO2
3	<b>HANDWRITING ANALYSIS</b>	Introduction to Handwriting Analysis - Principles of Handwriting Identification Development of individuality in handwriting. Class and individual characteristics of handwriting, Natural variations, Disguise and fundamental divergences in handwritings. Class and individual characteristics. Comparison of handwriting. Merits and demerits of exemplar and non-exemplar samples during comparison of handwriting. Types and Collection of Standards for comparison of handwriting.	8	CO3
4	<b>FORGERIES</b>	Different types of Forgeries (Freehand and Traced). Alterations in documents, including erasures, additions, over-writings and obliterations. Study of indented and invisible writings.	8	CO4
5	<b>CHARRED DOCUMENTS AND AUTHORSHIP EXAMINATION OF DOCUMENTS</b>	Analysis of Charred documents. Examination of counterfeit Indian currency notes, passports, visas and stamp papers. Determination of authorship in Disguised writing and anonymous letters (considering Forensic Linguistics and Stylistics, natural variation, class characteristics and individual characteristics of handwriting).	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](https://youtu.be/Is6t1EP_3eg)
- 3 <https://youtu.be/64gSr30GdyY>

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
<b>CO1</b>	3	3	3	2	3	3	3	2	3	3	3	2	3	3	2	3	2
<b>CO2</b>	3	3	2	3	3	2	3	3	3	3	3	3	2	3	2	3	3
<b>CO3</b>	3	2	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3
<b>CO4</b>	2	3	3	3	3	3	2	3	3	3	3	2	2	3	2	2	3
<b>CO5</b>	3	3	2	3	2	3	3	2	3	2	2	3	3	2	3	3	3

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

**Attributes & SDGs**

Course Code	Course Title	Attributes							SDGs No.	
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
FS309	QUESTIONED DOCUMENT EXAMINATION	√	√	√				√	√	3,4





## Integral University, Lucknow

<b>Effective from Session: 2021-22</b>							
<b>Course Code</b>	<b>FS310</b>	<b>Title of the Course</b>	<b>EXPLOSIVES</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>III</b>	<b>Semester</b>	<b>VI</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>
<b>Pre-Requisite</b>	<b>Nil</b>	<b>Co-requisite</b>	<b>Nil</b>				
<b>Course Objectives</b>	To develop the understanding and skills to analyze the explosion crime scene.						

Course Outcomes	
<b>CO1</b>	To develop the basic understanding about the explosives, their composition and characteristics.
<b>CO2</b>	Developing the understanding about the explosion, its types and protocols for crime scene processing in case of explosion.
<b>CO3</b>	To discuss about the importance of reconstruction of sequence of events and assessment of scene of explosion.
<b>CO4</b>	To develop the understanding about the examination of explosives and explosion residues in the laboratory using various chemical and instrumental techniques.
<b>CO5</b>	To discuss about the legal provisions of explosive act.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>INTRODUCTION TO EXPLOSIVES</b>	Introduction, Definition, Scope, Classification, composition and characteristics of explosives.	6	CO1
2	<b>EXPLOSIONS ANALYSIS</b>	Explosion, type of explosion, process and effects, types of hazard, effect of blast wave on structures, human etc. specific approach to scene of explosion, post-blast residue collection, preservation and packing.	6	CO2
3	<b>RECONSTRUCTION OF EXPLOSION SEEN</b>	Reconstruction of sequence of events, evaluation and assessment of scene of explosion.	6	CO3
4	<b>EXAMINATION OF EXPLOSION</b>	Systematic examination of explosives and explosion residues in the laboratory using chemical and instrumental techniques and interpretation of results.	6	CO4
5	<b>EXPLOSIVES &amp; LAW</b>	Explosives Act. Pyrotechnics, IEDs	6	CO5

Reference Books:	
1.	S. Ballou, M. Houck, J.A. Siegel, C.A. Crouse, J.J. Lentini and S. Palenik in Forensic Science, D.H. Ubelaker (Ed.), Wiley-Blackwell, Chichester (2013).
2.	R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004).
3.	Explosives DFS Manual, 2005
4.	Forensic Laboratory Handbook procedure and practice, Ashraf Mozayani, 2011
5.	Lab Manual Criminalistics An introduction to Forensic Science, Richard Saferstein (2007) Ninth Edition.
6.	J.D. DeHaan, Kirk's Fire Investigation, 3rd Edition, Prentice Hall, New Jersey (1991).
e-Learning Source:	
1.	<a href="https://youtu.be/JVI0yR4GdUo">https://youtu.be/JVI0yR4GdUo</a>
2.	<a href="https://youtu.be/xgKOuLb8LyM">https://youtu.be/xgKOuLb8LyM</a>
3.	<a href="https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==#">https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==#</a>

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
	<b>CO1</b>	3	2	3	2	3	2	2	2	3	3	3	2	3	3	2	3
<b>CO2</b>	2	3	2	3	3	2	3	2	2	3	3	3	2	3	2	3	3
<b>CO3</b>	3	2	3	3	3	3	3	2	2	3	2	2	3	3	3	2	2
<b>CO4</b>	2	3	3	2	2	3	2	3	3	3	3	2	2	3	2	2	3
<b>CO5</b>	3	2	3	3	2	3	3	2	3	2	2	3	3	2	3	2	3

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

Course Code	Course Title	Attributes							SDGs No.	
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
FS310	EXPLOSIVES	√	√	√				√	√	<b>3,4</b>



## Integral University, Lucknow

<b>Effective from Session: 2021-22</b>							
<b>Course Code</b>	<b>FS311</b>	<b>Title of the Course</b>	<b>FINGERPRINT &amp; IMPRESSIONS</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>III</b>	<b>Semester</b>	<b>VI</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>
<b>Pre-Requisite</b>	<b>Nil</b>	<b>Co-requisite</b>	<b>Nil</b>				
<b>Course Objectives</b>	To develop a deep understanding and knowledge about the fingerprints and their comparison.						

Course Outcomes	
<b>CO1</b>	To develop the deep understanding about the history of fingerprint and its importance, formation and classification of fingerprints.
<b>CO2</b>	Developing the understanding about the search and collection of fingerprints, different methods of development of fingerprints.
<b>CO3</b>	To discuss about the various aspects of lifting, preservation, examination & comparison of fingerprints.
<b>CO4</b>	To discuss in detail about the fingerprint Enhancement techniques on different surfaces and digital imaging of fingerprints.
<b>CO5</b>	To develop the understanding about collection and evaluation of lip prints, ear prints, shoe prints etc for forensic case work.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>INTRODUCTION TO FINGERPRINTS</b>	Introduction definition, scope, History and development of Fingerprint Science, formation of ridges, different type of ridge characteristics, classification of fingerprints – Henry system of classification, Single digital classification.	8	CO1
2	<b>FINGERPRINTS EXAMINATIONS</b>	Search and collection of Fingerprint, 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 powder method, fuming method, chemical method etc.	8	CO2
3	<b>FINGERPRINT COMPARISON</b>	Taking of finger prints from living and dead persons, preserving and lifting of fingerprints, photography of fingerprints, comparison of fingerprints, and basis of comparison, class characteristics, and individual characteristics, various type of ridge characteristic, AFIS	8	CO3
4	<b>FINGERPRINTS ENHANCEMENTS TECHNIQUES</b>	Fingerprint enhancement techniques: by optical techniques and specialized light sources, detection of fingerprints on porous surfaces, non-porous surfaces and their enhancements. Digital imaging of fingerprints: Introduction, image format, fingerprint image enhancement by MATLAB.	8	CO4
5	<b>OTHER IMPRESSIONS</b>	Lip prints, Ear prints, Foot prints, Bite marks, Shoe prints, Tire marks/skid marks: their importance, natural location, collection and evaluation, taking controlled samples for forensic comparison.	8	CO5

Reference Books:	
1.	Henry, E.R., Classification and Uses of Finger Prints, George Routledge and Sons Ltd
2.	Nath, S., Fingerprint Identification, Shiv Shakti Book Traders, New Delhi, 2010.
3.	James, S. H. and Nordby, J. J. (Eds), Forensic Science - An Introduction to Scientific and Investigation Techniques, CRC Press, London, 2003
4.	Sudha, S.I., Biometrics and Fingerprint Analysis, Selective and Scientific Books, New Delhi, 2012

e-Learning Source:	
1.	<a href="https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjv3c0vICLa6VYg==#">https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjv3c0vICLa6VYg==#</a>
2.	<a href="https://youtu.be/Thk-M4kuJzs">https://youtu.be/Thk-M4kuJzs</a>

PO-PSO CO	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	3	2	3	2	3	2	2	3	3	3	3	2	3	3	2	3	2
<b>CO2</b>	2	3	2	3	3	2	3	2	2	3	3	3	2	3	2	3	3
<b>CO3</b>	3	3	2	2	3	3	3	2	2	3	2	2	2	2	3	3	3
<b>CO4</b>	2	3	3	2	2	3	2	3	3	3	3	2	2	3	3	2	2
<b>CO5</b>	3	2	3	3	2	3	3	2	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.	
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value		Professional Ethics
<b>FS311</b>	<b>FINGERPRINT &amp; IMPRESSIONS</b>	√	√	√			√	√	<b>3,4</b>



## Integral University, Lucknow

<b>Effective from Session: 2021-22</b>							
<b>Course Code</b>	<b>FS312</b>	<b>Title of the Course</b>	<b>INSTRUMENTAL AND ANALYTICAL TECHNIQUE</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>III</b>	<b>Semester</b>	<b>VI</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>
<b>Pre-Requisite</b>	<b>Nil</b>	<b>Co-requisite</b>	<b>Nil</b>				
<b>Course Objectives</b>	To develop the understanding about the different instrumental techniques used in the field of forensic sciences						

Course Outcomes	
<b>CO1</b>	Discuss about the general introduction and classification of instrumental method.
<b>CO2</b>	Developing the basic understanding and theory of spectrophotometry & colorimetry along with the application in the field of forensic science.
<b>CO3</b>	To discuss about the basic understanding, theory and instrumentation of emission spectroscopy along with the application in the field of forensic science.
<b>CO4</b>	To develop the understanding about the basic principles and advantages of different types of microscopes used in the field of forensic science.
<b>CO5</b>	To discuss about the Centrifugation Techniques and Electrophoretic Technique.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>INTRODUCTION TO INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS</b>	General introduction, classification of instrumental method, spectroscopy, properties, of electromagnetic radiation, introduction of electromagnetic radiation with matter origin of spectrum.	8	CO1
2	<b>VISIBLE SPECTROPHOTOMETRY &amp; COLORIMETRY</b>	Introduction, theory of spectrophotometry & colorimetry, deviation from Beer's law, instrumentation, application of Colorimetry & spectrophotometry.	8	CO2
3	<b>EMISSION SPECTROSCOPY</b>	Introductory, theory, instrumentation, spectrograph, application, of emission spectroscopy, advantages and disadvantages of emission spectroscopy.	8	CO3
4	<b>MICROSCOPY</b>	Basic principles of simple microscope, phase contrast microscope, stereoscopic microscopic and compound microscope, comparison microscope, polarizing microscope, fluorescent microscope.	8	CO4
5	<b>CENTRIFUGATION &amp; ELECTROPHORETIC TECHNIQUE</b>	<b>Centrifugation Techniques:</b> Basic principles of sedimentation, various types of centrifuges, Density gradient centrifugation, Preparative centrifugation, Analysis of sub-cellular fractions, Ultra-centrifuge- Refrigerated Centrifuges. <b>Electrophoretic Technique:</b> General principles, Factors affecting electrophoresis, Low voltage thin sheet electrophoresis, High voltage electrophoresis, Sodium dodecyl sulphate (SDS) polyacrylamide gel-electrophoresis, Isoelectric focusing (IEF), Iso-electrophoresis, Preparative electrophoresis, Horizontal and Vertical electrophoresis.	8	CO5

### Reference Books:

- Wilson And Walkers, Principles And Techniques Of Biochemistry And Molecular Biology 8th South Asia Edition 2018 by HOFMANN A, CAMBRIDGE UNIVERSITY PRESS
- Chapmen, J.R., Practical Organic Mass spectrometry, A Guide for Chemical and Biochemical Analysis, Wiley, New York, 1993.
- Gchristian, Gray D and Fredric J. Feldman, Atomic Absorption Spectroscopy; Wiley-Interscience, London, 1970.
- Stout G.H., & Jensten, L.H., X-ray Structure Determination – A practical Guide, 2nd Ed., Wiley, New York, 1989.
- M. Silverstein, Baster, G.C. & Morsill, T. C., Spectrometric identification of Organic Compounds, 4thEdn., Wiley, New York, 1981

### e-Learning Source:

- <https://youtu.be/8QUo6Wi1oNA>
- <https://www.youtube.com/live/Ry7wxRs54YY?feature=share>
- <https://www.youtube.com/live/nahTaPM37uM?feature=share>

PO-PSO CO	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	3	2	3	2	3	2	2	3	3	3	3	2	3	3	2	3	2
<b>CO2</b>	2	3	2	3	3	2	3	2	2	3	3	3	2	3	2	3	3
<b>CO3</b>	3	3	2	2	3	3	3	2	2	3	2	2	2	2	3	3	3
<b>CO4</b>	2	3	3	2	2	3	2	3	3	3	3	2	2	3	3	3	2
<b>CO5</b>	3	2	3	3	2	3	3	2	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.	
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
FS312	INSTRUMENTAL AND ANALYTICAL TECHNIQUE	√	√	√				√	√	3,4



## Integral University, Lucknow

<b>Effective from Session: 2021-22</b>							
<b>Course Code</b>	<b>FS313</b>	<b>Title of the Course</b>	<b>QUESTIONED DOCUMENT EXAMINATION-LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>III</b>	<b>Semester</b>	<b>VI</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>
<b>Pre-Requisite</b>	<b>Nil</b>	<b>Co-requisite</b>	<b>Nil</b>				
<b>Course Objectives</b>	To provide a detailed practical knowledge to analyze different types of forgeries and questioned documents.						

Course Outcomes	
<b>CO1</b>	Students will be able to identify the class and individual characters of handwriting
<b>CO2</b>	Students will be able to study and analyze different types of forgeries
<b>CO3</b>	To decipher the secret writing
<b>CO4</b>	To study the counterfeit currency
<b>CO5</b>	To study the indented writing

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>INTRODUCTION TO QUESTIONED DOCUMENTS ANALYSIS OF QUESTIONED DOCUMENTS HANDWRITING ANALYSIS FORGERIES CHARRED DOCUMENTS AND AUTHORSHIP EXAMINATION OF DOCUMENTS</b>	To identify handwriting characters (class and individual)	30 hrs.	CO1-5
2		To compare handwriting samples.		
3		To study free hand forgery.		
4		To study and detect different types of traced forgery.		
5		To study erasures, alterations and obliterations in handwriting samples.		
6		To study indented writings		
7		To study secret writings		
8		To study counterfeit currency notes, passports and visa.		

**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.

**e-Learning Source:**

1. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==#>
2. [https://youtu.be/Is6t1EP\\_3eg](https://youtu.be/Is6t1EP_3eg)
3. <https://youtu.be/64gSr30GdyY>

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
<b>CO1</b>	3	3	3	2	3	3	3	2	3	3	3	2	3	3	2	3	2
<b>CO2</b>	3	3	2	3	3	2	3	3	3	3	3	3	2	3	2	3	3
<b>CO3</b>	3	2	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3
<b>CO4</b>	2	3	3	3	3	3	2	3	3	3	3	2	2	3	2	2	3
<b>CO5</b>	3	3	2	3	2	3	3	2	3	2	2	3	3	2	3	3	3

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

**Attributes & SDGs**

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
FS313	QUESTIONED DOCUMENT EXAMINATION-LAB	√	√	√			√	√	3,4



## Integral University, Lucknow

<b>Effective from Session: 2021-22</b>							
<b>Course Code</b>	<b>FS314</b>	<b>Title of the Course</b>	<b>FINGERPRINTS &amp; IMPRESSIONS - LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	<b>III</b>	<b>Semester</b>	<b>VI</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>
<b>Pre-Requisite</b>	<b>NIL</b>	<b>Co-requisite</b>	<b>Nil</b>				
<b>Course Objectives</b>	To provide a detailed practical knowledge to analyze fingerprints and impressions.						

Course Outcomes	
<b>CO1</b>	To record and identify fingerprints
<b>CO2</b>	Students will be able to carry out ten-digit classification of fingerprints
<b>CO3</b>	Students will be able to identify different ridge characteristics
<b>CO4</b>	Photography and documentation of fingerprints
<b>CO5</b>	Forensic examination of lip prints, ear prints and bite marks.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>INTRODUCTION TO FINGERPRINTS EXAMINATIONS FINGERPRINT COMPARISON FINGERPRINTS ENHANCEMENTS TECHNIQUES OTHER IMPRESSIONS</b>	To record plain and rolled fingerprints and identify different fingerprint patterns	30 hrs.	CO-1-5
2		To carry out ten-digit classification of fingerprints.		
3		To identify and classify core and delta.		
4		To identify different ridge characteristics		
5		To carry out ridge tracing and ridge counting.		
6		Document and Fingerprint Photography		
7		To develop Latent fingerprints with Powder methods & lifting of fingerprints.		
8		To record lip prints and forensic examination of lip prints		
9		To record ear prints and their specific features for forensic comparison		
10		Forensic examination of tier/skid marks		

**Reference Books:**

1. Henry, E.R., Classification and Uses of Finger Prints, George Routledge and Sons Ltd
2. Nath, S., Fingerprint Identification, Shiv Shakti Book Traders, New Delhi, 2010.
3. James, S. H. and Nordby, J. J. (Eds), Forensic Science - An Introduction to Scientific and Investigation Techniques, CRC Press, London, 2003
4. Sudha, S.I., Biometrics and Fingerprint Analysis, Selective and Scientific Books, New Delhi, 2012

**e-Learning Source:**

1. <https://youtu.be/Thk-M4kuJzs>
2. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjv3c0vICLa6VYg==#>

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
<b>CO1</b>	3	2	3	2	3	2	2	3	3	3	3	2	3	3	2	3	2
<b>CO2</b>	2	3	2	3	3	2	3	2	2	3	3	3	2	3	2	3	3
<b>CO3</b>	3	3	2	2	3	3	3	2	2	3	2	2	2	2	3	3	3
<b>CO4</b>	2	3	3	2	2	3	2	3	3	3	3	2	2	3	3	2	2
<b>CO5</b>	3	2	3	3	2	3	3	2	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.	
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
FS314	FINGERPRINTS & IMPRESSIONS - LAB	√	√	√				√	√	<b>3,4</b>

