NEHRU ARTS AND SCIENCE COLLEGE

(An Autonomous Institution affiliated to Bharathiar University)
(Reaccredited with "A" Grade by NAAC, ISO 9001:2015 & 14001:2004 Certified
Recognized by UGC with 2(f) &12(B), Under Star College Scheme by DBT, Govt. of India)
Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu.

REGULATIONS, CURRICULUM & SYLLABUS

B. Sc. FORENSIC SCIENCE

Semester I to VI

Effective from 2022– 2023

CURRICULUM

NEHRU ARTS AND SCIENCE COLLEGE

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B.Sc. FORENSIC SCIENCE

Programme Outcomes:

At the end of the course, the learners will be able:

PO1: To demonstrate academic proficiency in the core area of forensic science.

PO2: To use the scientific techniques of forensic science in investigations.

PO3: To systematically and scientifically collect evidences from crime scene

PO4: To analyse evidences using scientific techniques and form opinion based on it.

PO5: To aid and advice the criminal justice system in investigation, trial, correctional administration and victim support.

PO6: To develop skillset required for contributing towards the research and development in forensic Science.

PO7: Utilizing the existing techniques of forensic science in private investigations.

PO8: Understanding the emerging trends in Forensic Science and its applications in industrial context.

Programme Specific Outcomes:

PSO1: Understand the concept of criminal justice system, principles of crime & investigation.

PSO2: Understand the various techniques used in the analysis of evidences obtained as a byproduct of crime

PSO3: Develop skill to design and conduct experiments for the analysis of evidences based on the protocols provided by authorized agencies.

PSO4: Architect skill sets in assisting investigations, trials and correctional administration.

PSO5: Utilize the laboratory skills in industrial applications

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SCHEME OF EXAMINATION

B. Sc Forensic Science

(Programme code : UFR)

(Applicable to all the students admitted during the academic year 2022-2023 onwards)

Semester	Part	Course code	Name of the course	Instructional Hours/week	Duration of Examination	Examination Marks			Credits
						CIA	ESE	Total	
I	I	22U1TAM101/ 22U1HIN101/ 22U1MAL101/ 22U1FRN101	Elanthamizh Rachnathmak Hindi Kadhayum Samskaravum Le Francais Fondamental - 1	5	3	50	50	100	4
	II	22U2ENG101	Professional English I	5	3	50	50	100	4
	III	22U3FRC101	Core Paper I - General Forensic Science	6	3	50	50	100	4
		22U3FRP102	Core Paper II - Crime Scene Management Practical	6	3	50	50	100	4
		22U3FRA101	Allied Paper I - Forensic Chemistry	5	3	50	50	100	4
	IV	21U4ENV101	@Ability Enhancement Compulsory Course : Environmental Studies	2	3	50	-	50	2
		22U4HVY201	Value Education : Human Values and Yoga Practice	1	-	-	-	-	-
				30				**550**	**22**
II	I	22U1TAM202/ 22U1HIN202/ 22U1MAL202/ 22U1FRN202	Pynthamizh Sanchar Hindi Novelum Bhashaapadanavum Le Francais Fondamentale - II	5	3	50	50	100	4
	II	22U2ENG202	Professional English II	5	3	50	50	100	4
	III	22U3FRC203	Core Paper III - Ballistics and Tool Marks	6	3	50	50	100	4
		22U3FRP204	Core Paper IV - Ballistics and Tool Marks Practical	6	3	50	50	100	4
		22U3FRA202	Allied Paper II - Instrumental Techniques I	5	3	50	50	100	4
	IV	21U4HRC202	@Ability Enhancement Compulsory Course : Human Rights and Constitution of India	2	3	50	-	50	2
		22U4HVY201	@Value Education : Human Values and Yoga Practice	1	2	50	-	50	2
				30				**600**	**24**

III	I	22U1TAM303/ 22U1HIN303/ 22U1MAL303/ 22U1FRN303	Arunthamizh Sahityak Hindi Kavithayum Smaranayum Le Francais General - III	5	3	50	50	100	4
	II	22U2ENG303	Communicative English - I	5	3	50	50	100	4
	III	22U3FRC305	Core Paper V - Forensic Physics	5	3	50	50	100	4
		22U3FRP306	Core Paper VI - Forensic Physics Practical	4	3	50	50	100	4
		22U3FRA303	Allied Paper III - Forensic Biology	4	3	50	50	100	4
	IV	22U4FRS301	Skill Based Paper I - Introduction to Digital Evidences	3	2	30	45	75	3
		22U4NM3BT1/ 22U4NM3AT1/ 22U4NM3CAF/ 22U4NM3GST/ 22U4NM3WRT	# @ Basic Tamil - I ## Advanced Tamil - I * NME: Consumer Affairs / Gender Sensitization / Women's Rights	2	3	50		50	2
		SBOEC	Skill Based Open Elective Course -Extra Departmental Course	2	3	-	50	50	2
		22U4FRVALC	**Skill Enhancement Add on course - Institute Industry Linkage	-	-	-	-	-	-
				30				**675**	**27**
IV	I	22U1TAM404/ 22U1HIN404/ 22U1MAL404/ 22U1FRN404	Muththamizh Prayogik Hindi Drisyakalaa Saahithyam Le Francias General - IV	5	3	50	50	100	4
	II	22U2ENG404	Communicative English - II	5	3	50	50	100	4
	III	22U3FRC407	Core Paper VII - Biometrics and Impression Analysis	5	3	50	50	100	4
		22U3FRP408	Core Paper VIII - Biometrics and Impression Analysis Practical	4	3	50	50	100	4
		22U3FRA404	Allied Paper IV - Instrumental Techniques - II	4	3	50	50	100	4
	IV	22U4FRS402	Skill Based Paper II - Research methodology and Statistics	3	3	30	45	75	3
		22U4NM4BT2/ 22U4NM4AT2/ 21U4NM4GEN	# @Basic Tamil - II ##Advanced Tamil - II General Awareness	2	3	50		50	2
		VBOEC	Value Based Open Elective Course - Intra School Course	2	3	-	50	50	2
		22U4FRVALC	**Skill Enhancement Add on course- Institute Industry Linkage	-	-	-	-	-	Grade
				30				**675**	**27**
V	III	22U3FRC509	Core Paper IX - Serology and DNA Typing	5	3	50	50	100	4
		22U3FRC510	Core Paper X - Forensic Toxicology	5	3	50	50	100	4
		22U3FRT511	Core Paper XI - Outdoor Training	5	3	50	50	100	4
		22U3FRP512	Core Paper XII - Serology and Toxicology Practical	5	3	50	50	100	4
		22U3FRE501/ 22U3FRE502/ 22U3FRE503	Discipline Specific Elective Paper - I	6	3	50	50	100	4
	IV	22U4FRS503	Skill Based Paper III - Law for Forensic Science	4	3	30	45	75	3
				30				**575**	**23**

VI	III	22U3FRC613	Core Paper XIII - Questioned Document Examination	6	3	50	50	100	4
		22U3FRP614	Core Paper XIV- Questioned Document Examination Practical	6	3	50	50	100	4
		22U3FRT604/ 22U3FRT605/ 22U3FRT606	Discipline Specific Elective Paper - II	6	3	50	50	100	4
		22U3FRV607/ 22U3FRE608/ 22U3FRE609	Discipline Specific Elective Paper - III	6	3	50	50	100	4
	IV	22U4FRS604	Skill Based Paper IV - Audio Video and Speaker Identification	6	3	30	45	75	3
	V	22U5EXT601	Extension Activities	-	-	-	50	50	2
				30				**525**	**21**
							Total	**3600**	**144**
Additional Credit (Optional)			Semester II - VI						**8 $**

 # Basic Tamil - Students who have not studied Tamil up to 12th standard.
Advance Tamil – Students who have studied Tamil language up to 12th standard and chosen other languages under part I of the programme but would like to advance their Tamil language skills.
*** NME** – Students shall choose any one course out of three courses.
@ No End Semester Examinations. Only Continuous Internal Assessment (CIA)
$ - Not included in Total marks & CGPA Calculation
****** Examination and Evaluation for Value Added Courses shall be conducted by the Industry and the Institute and marks shall be submitted to the COE for the award of Grade.

List of Discipline Specific Elective papers (Choose any one of the papers)

Elective-I	Subject Code		Name of the Subject
Discipline Specific Elective – I	22U3FRE501	A	Introduction to Forensic Finance
	22U3FRE502	B	Introduction to Cyber Forensic Science
	22U3FRE503	C	Forensic Psychology
Discipline Specific Elective – II	22U3FRT604	A	Internship ; Analytical Science
	22U3FRT605	B	Internship ; Legal Services
	22U3FRT606	C	Internship ; Police and Correctional Administration
Discipline Specific Elective – III	22U3FRV607	A	Project and Viva voce
	22U3FRE608	B	Criminal Procedure and Evidence
	22U3FRE609	C	Forensic Medicine and Anthropology

Departmental Courses Offered by Forensic Science Department to other Department Students

Sl.No.	Semester	Course Code	Name of the Course
1	III	22U4FR3ED1	Fundamental Due Diligence
2		22U4FR3ED2	Introduction to Jurisprudence

Intra School Course offered by the Department to other Department Students (within the School)

S. No	Course Code	Name of the Course
1	22U4VBOE01	Design Ecosystem
2	22U4VBOE02	Design Thinking
3	22U4VBOE03	Disaster Management
4	22U4VBOE04	Environmental Pollution and Waste Management (EMS)
5	22U4VBOE05	History of Ancient India
6	22U4VBOE06	Indian Knowledge System
7	22U4VBOE07	Principles of IPR
8	22U4VBOE08	Science, Society and Culture
9	22U4VBOE09	Community Engagement
10	22U4VBOE10	Emotional Intelligence
11	22U4VBOE11	Fundamentals of Tourism
12	22U4VBOE12	Health Education
13	22U4VBOE13	Media and Politics
14	22U4VBOE14	Positive Psychology and Work Life
15	22U4VBOE15	Professional Ethics
16	22U4VBOE16	The Science of Happiness
17	NCC	

- Students shall opt any course within their Schools.
- NCC – Students who qualify NCC B Certificate Examination need not appear for these open Electives. The Credits shall be transferred.

Self-Study Paper offered by Forensic Science Department

Sl. No.	Semester	Course code	Course Title
1	Semester II to V	22UFRSS01	Serious Fraud Investigation
2		22UFRSS02	Corporate Law

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Nehru Arts and Science College, Coimbatore

Course Code	Title		
22U3FRC101	Core Paper I - General Forensic Science		
Semester : I	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	To learn the fundamental principles of forensic science and processing crime scene in a systematic manner.		
Course Category	Knowledge		
Development Needs	Global		
Course Description	General forensic science deals with the history, development and governing principles of Forensic Science. This course also provide insight about the systematic processing of different crime scenes.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basics of Forensic Science.	Lecture / Flipped Classroom	Assignment
CO 2	Understand the legal framework in which forensic science operates.	Lecture / Flipped Classroom	Quiz
CO 3	Processing crime scenes systematically.	Lectures / Hands-on training	Assignment
CO 4	Collection and packing of evidences in the most appropriate way.	Tutorial / Lecture	Seminar
CO 5	Documenting the crime scene and maintain chain of custody	Lecture / Training	Case assessment

Offered by Forensic Science

Course Content **Instructional Hours / Week : 6**

Unit	Description	Text Book	Chapters
I	**Introduction** Forensic Science: Definition, history and development - Scope and need of forensic science in criminal justice system- Development of forensic science in India- Principles of forensic science - Tools and techniques used in forensic science and various disciplines in forensic science- Organization setup of Forensic Science Laboratory: Structure and function of State, Regional and Central Forensic Science Laboratories. Role of Mobile Forensic Science Laboratory in crime scene investigation.	1	1
	Instructional Hours		**18**
Suggested Learning Methods: **Video lectures**			
II	**Education in Forensic Science** Education in Forensic Science, Ethics in Forensic Science and Role of Media- Duties & Qualification of Forensic Scientist- Forensic Scientist at the Crime Scene- Presentation of Expert Evidence, Evidence in The Court of Law, Report writing & Evidence presentation, Components of reports and report format (according to ISO/IEC 17025:2005).	1	2
	Instructional Hours		**18**
Suggested Learning Methods: Moot court Practice			

III	**Crime Scene Investigation** Definition of crime and crime scene- Types of crime scenes: Primary, Secondary, Indoor and Outdoor- Concept of evidence- evidence classification: direct, circumstantial, physical, biological, corroborative, conclusive, trace and testimonial- Locard's principle of exchange- Elements of crime scene: Information from victim, witness, crime scene, suspects, databases and records- Agencies involved in crime scene management: Police, Medico legal experts, Judicial officers- Actions of first responding officer: Objectives, documentation, officer safety, emergency care, secure and control, release scene to appropriate authorities. Steps of crime scene investigation.	1	3
		Instructional Hours	**18**
Suggested Learning Methods: Video lectures			
IV	**Search and Documentation of Crime Scene** Documenting crime scene: Crime scene photography: Location and scene, long-range mid-range and short range photographs- Importance of scale- Use of L scale - Search: definition, objectives and search patterns - Strip method, grid method, zone/quadrant method, spiral method (inward and outward), Point to point method, wheel method- Crime scene sketching: Indoor and outdoor, triangulation method, baseline method, polar coordinate method.	1	4
		Instructional Hours	**18**
Suggested Learning Methods: Practice using set-up crime scenes			
V	**Collection, packing and forwarding of evidences** Collection, packaging and preservation of physical evidence and general considerations- Stages of investigation: data collection, analysis, hypothesis formulation, testing, theory formation. Forwarding of evidences: Packing and sealing of evidences, preparation of questionnaire- Chain of custody: Importance and maintenance- Documents to be submitted to FSL along with evidences.	1	5
		Instructional Hours	**18**
Suggested Learning Methods: Laboratory practice			
		Total Hours	**90 Hrs**

Text Books	1. General Forensic Science: Compiled by Dept. of Forensic Science, Nehru Arts and Science College Coimbatore.
Reference Books	1. An Introduction To Forensic Scientific and Investigative Techniques", Stuart.H.James and Jon. J. Nordby, Third Edition, CRC Press, 2007. 2. Criminalistics- An Introduction To Forensic Science, Saferstein.R , Printice Hall Inc. USA , 2003.

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	M	L	L	H	L	H	L	H	M	L	M	L
CO2	H	M	M	L	H	L	H	L	H	M	L	M	L
CO3	H	H	M	L	H	L	H	L	H	M	L	M	L
CO4	H	H	M	L	H	L	H	L	M	M	L	M	L
CO5	H	H	M	L	H	L	h	L	H	M	L	M	L
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U3FRP102	Core Paper II - Crime Scene Management Practical		
Semester : I	Credits : 4	CIA : 50 Marks	ESE : 50 Marks

Course Objective	Provide students with an understanding of the systematic methods of crime scene analysis.
Course Category	Employability
Development Needs	Global
Course Description	Scientific study of crime scene for the systematic collection and packaging of evidences.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Identify possible evidences from a crime scene.	Demonstration / Video Lessons	Practical
CO 2	Document a crime scene.	Demonstration	Practical
CO 3	Collect and pack evidences scientifically.	Demonstration / Video Lessons	Practical
CO 4	Maintain chain of custody	Demonstration / Video Lessons	Practical
CO 5	Study the legal aspects of crime scene management	Demonstration / Video Lessons	Practical

Offered by	**Forensic Science**
Course Content	**Instructional Hours / Week : 6**

S. No.	Experiment
1	To prepare a report on evaluation of crime scene.
2	Seizure of the premises of the crime scene, clothing, accessibility and chronology of investigation.
3	Photography of crime scene.
4	Searching and Listing of evidences at indoor crime scene.
5	Searching and Listing of evidences at outdoor crime scene.
6	Sketching of Crime scene by triangulation method
7	Sketching of Crime scene by baseline method.
8	Evidence collection, packaging, sealing and labelling.
9	Analysis of blood stains pattern using photograph.
10	Study of legal aspects of crime scene analysis
	TOTAL 90 Hours

Tools for Assessment (50 Marks)						
Analytical Skill	**Lab Performance**	**Inference**	**Test I**	**Test II**	**Observation**	**Total**
8	**8**	**8**	**10**	**10**	**6**	**50**

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	H	-	-	-	-	M	L	H	H	H	H	L
CO2	H	H	-	-	-	-	M	L	M	L	H	H	L
CO3	H	H	-	L	-	-	M	L	H	M	H	M	L
CO4	H	H	-	L	-	-	M	L	H	L	H	H	L
CO5	H	H	-	M	-	-	M	L	H	H	H	M	L
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U3FRA101	Allied Paper I - Forensic Chemistry		
Semester : I	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	To develop knowledge about various chemical evidences and skills to analyse them.		
Course Category	Employability		
Development Needs	Global/National		
Course Description	Forensic Chemistry deals with Forensic Analysis of various chemical evidences. The course includes features, collection methods, analysing techniques of chemical samples.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the chemical properties of various chemical evidences.	Lecture / Flipped Classroom	Assignment
CO 2	Learn the techniques to collect and pack chemical evidences.	Video lectures / Tutorials	Seminar
CO 3	Acquire skills to analyse chemical evidences.	Lectures/ Tutorials	Quiz
CO 4	Develop detailed awareness about the effects of drugs in individual and social levels.	Tutorial / Case Studies	Activity
CO 5	Introduce the concept of quality control.	Lecture / Tutorials	Assignment

Offered by	Forensic Science

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Petroleum products** Petroleum products: types, by products, uses and importance. Examination of petroleum products: distillation and fractionation. Commercial uses. Standard methods of analysis of petroleum products for adulteration. Scope, importance and forensic importance of analysis for the adulterants in petroleum products.	1	all
	Instructional Hours		**15**
Suggested Learning Methods: **Reference to DFS Manuals**			
II	**Arson** Chemistry of fire, pyrolysis, combustion, fire tetrahedron, flash point and ignition temperature. Fire categories, burn patterns, finding the igniter. Investigation of arson cases, functions of a fire investigator, collection preservation and packing of fire evidences. Lab analysis of the evidence, instrumental techniques used.	1	all
	Instructional Hours		**15**
Suggested Learning Methods: Reference to DFS Manuals			
III	**Explosives** Introduction, classification, composition and characteristics. Synthesis and actions of explosives (TNT, PETN and RDX, IED). Explosion process and affects, types of explosions, post blast	2	all

	residue collection. Examination of explosion residues in laboratory (chemical and instrumental).		
		Instructional Hours	**15**
Suggested Learning Methods: Reference to DFS Manuals			
IV	**Drugs of abuse** Drugs: definition, classification and scope and forensic importance- Commonly consumed drugs, their mode of actions, symptoms, street names, methods of consumption- Analysis of drugs: chemical and instrumental. Spot tests and qualitative analysis- Importance of physical and biochemical instrumentation in the field of dug analysis.	3	all
		Instructional Hours	**15**
Suggested Learning Methods: Reference to DFS Manuals			
V	**Alcohol** Analysis of Ethyl alcohol in beverages , liquors, biological fluids and breath, Analysis of Methanol and Denaturants, Illicit liquors, Analysis of Chemicals in Trap Cases.	4	5
		Instructional Hours	**15**
Suggested Learning Methods: Reference to DFS Manuals			
		Total Hours	**75 Hrs**

Text Books	1. DFS Manual- Petroleum: Published by Directorate of Forensic Science, Govt. of India 2. DFS Manual- Explosives: Published by Directorate of Forensic Science, Govt. of India 3. DFS Manual- Narcotics: Published by Directorate of Forensic Science, Govt. of India 4. Forensic Chemistry: Compiled by Dept. of Forensic Science, Nehru Arts and Science College Coimbatore.
Reference Books	1. Standard methods of chemical analysis; Welcher Frank; Van Nostrand Reinhold; 6th edition. 2. Fire scene evidence; Almirall J R & Furton K G; CRC Press (2004)

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	H	L	L	-	H	L	L	H	H	L	L
CO2	H	M	H	L	L	-	H	L	L	H	H	L	L
CO3	H	M	M	H	L	-	H	L	L	H	H	L	L
CO4	H	M	M	L	L	-	H	L	H	H	L	M	L
CO5	H	M	H	L	L	-	H	L	M	H	M	M	L

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U3FRC203	Core Paper III - Ballistics and Tool Marks		
Semester : II	Credits : 4	CIA : 50 Marks	ESE : 50 Marks

Course Objective	To learn to solve the various crimes in which firearms and tools are involved.
Course Category	Employability
Development Needs	Global/National
Course Description	Forensic Ballistics deals with Forensic Analysis of evidences related to firearms and tool marks. The course includes features, collection methods and analysis of ballistics evidences and tool marks.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To know the basic working of firearms and ammunition	Lecture/Demonstration	Assignment
CO 2	Develop skills to handle firearms and ammunition.	Video lectures/Tutorials	Seminar
CO 3	To develop skills to investigate the various crimes in which firearms are involved	Lectures/ Tutorials	Quiz
CO 4	Learn the science of comparison of bullets and cartridge cases.	Tutorial / Case Studies	Activity
CO 5	Acquire skills to develop tool marks from crime scene and analyse it.	Lectures/ Tutorials	Assignment

Offered by | **Forensic Science**

Course Content — **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapters
I	**Introduction to Ballistics** Scope of forensic ballistics- History of firearms: lock mechanism of various firearms- Firearms: Classification: Based on riffling, action mechanism and loading- Parts of firearms: Butt, chamber, magazine, firing mechanism and barrel. Concept of bore and calibre. Improvised, country made & imitative firearms. Features of the following firearms: 12 bore, INSAS, 0.315, revolver, pistol, carbine, AK 47, SLR.	1	1,2,3
		Instructional Hours	**18**
Suggested Learning Methods: **Library extra reading**			
II	**Internal and Intermediate Ballistics** Ammunition, Cartridge case, Primer, Propellant, Bullets, Pellets and Wads. Use of lead as bullet material. Internal Ballistics: Definition, Chemical composition of primer and propellant (black powder, single base, double base, cordite). Ignition and burning of propellants. Degressive and progressive burning. Pressure developed inside the barrel. Theory of recoil. Intermediate Ballistics: Definition, effects on the motion of projectile by firearm, gas flow field near the muzzle, muzzle flash, muzzle blast and silencers.	1	3.4
		Instructional Hours	**18**
Suggested Learning Methods: Video lectures			

III	**External Ballistics and Terminal Ballistics :** External Ballistics: Definition, vacuum trajectory, Equations of motion of projectile, gyroscopic equilibrium of bullets, vacuum trajectory- calculation, effect of air resistance on trajectory and nature of air-resistance phenomena. Terminal Ballistics: Definition. Physics of shock waves, shock waves within the body; Cavitations, temporary and permanent cavities. Behaviour of various types of bullets on hitting the target, Ricochet and its forensic aspects.	1	4
		Instructional Hours	**18**
Suggested Learning Methods: Hands on training			
IV	**Evidentiary Clues :** Calculation of trigger pull Determination of range of firing for shotguns: Burning, scorching, blackening and Tattooing. Characteristics of contact shots, Walker's test. Evidentiary clues: Types, occurrence, collection and packing. Matching of crime & test Bullets and cartridge cases. Comparison microscope, Identification of bullets and their comparison. Factors affecting the formation of striations. Gun Shot Residues (GSR): formation, composition and positioning of GSR. Collection, chemical methods of analysis and instrumental methods of analysis.	1	5,6
		Instructional Hours	**18**
Suggested Learning Methods : Laboratory practice			
V	**Tool Marks :** Types of tool marks : compression marks, striated marks, combination of compression and striated marks, repeated marks. Class characteristics and individual characteristics; Tracing and Lifting of tool marks. Photographic examination of tool marks and cut marks; Forensic examination and comparison of tool marks. Expert testimony in tool marks. Comparison microscope and its applications in tool mark analysis.	1	6
		Instructional Hours	**18**
Suggested Learning Methods: Online training			
		Total Hours	**90 Hrs**

Text Books	1. Sharma, B.R. (2017) *Firearms in criminal investigation and trials: An integrative approach*. Gurgaon, Haryana, India: Lexis Nexis.
Reference Books	1. J. Howard Mathews, Charles C. Thomas; Firearms Identification, Vol.-I, II & III, Springfield Illinois, 1973. 2. Hatcher, Jury and Weller; Firearms Investigation, Identification and Evidence, Stackpole Books, Harrisburg, PA, 1977. 3. Vincent Di Maio; Gunshot Wounds, CRC Press, Washington, DC, 1999. 4. Brain J. Heard; Hand book of Firearms and Ballistics, John Willey England, 1997. 5. TA. Warlow; Firearms- The Law and Forensic Ballistics Taylor and Francis London, 1996.

Tools for Assessment (50 Marks)						
CIA I	**CIA II**	**CIA III**	**Assignment**	**Seminar**	**Quiz**	**Total**
8	**8**	**10**	**8**	**8**	**8**	**50**

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	H	M	-	L	L	L	M	H	L	L
CO2	H	H	H	H	M	-	H	H	L	H	H	M	H
CO3	M	H	H	H	M	-	L	L	L	H	H	L	L
CO4	M	M	H	H	M	-	L	L	L	H	H	L	L
CO5	M	H	M	H	M	-	L	L	L	M	H	-	L

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U3FRP204	Core Paper IV - Ballistics and Tool Marks Practical		
Semester : II	Credits : 4	CIA : 50 Marks	ESE : 50 Marks

Course Objective	To learn the techniques of analysing ballistics and tool marks evidences
Course Category	Employability
Development Needs	Global/National
Course Description	Forensic Ballistics deals with Forensic Analysis of evidences related to firearms and tool marks. The course includes features, collection methods and analysis of ballistics evidences and tool marks

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Identify various cartridges, bullets and cartridge cases.	Demonstration / Video Lessons	Practical
CO 2	Identify different firearms	Demonstration/ Video Lessons	Practical
CO 3	Acquire skills to conduct various spot tests related to ballistics	Demonstration / Video Lessons	Practical
CO 4	Systematic lifting of tool marks from various surface.	Demonstration / Video Lessons	Practical
CO 5	Develop skill to compare tool marks	Demonstration / Video Lessons	Practical

Offered by	**Forensic Science**
Course Content	**Instructional Hours / Week : 6**

S. No.	Experiment
1	Identification of parts of firearms
2	Preliminary examination of various characteristics of fired bullets and shots.
3	Preliminary examination of various characteristics of fired cartridge cases.
4	Chemical tests for powder residues and barrel wash.
5	Examination and comparison of fired and test bullets and shots.
6	Examination and comparison of fired and test cartridge cases.
7	Collection and packing of Gun Shot Residues.
8	Identification of bullet using holes physical and chemical examination.
9	Lifting of tool marks from different surfaces
	TOTAL 90 Hours

Tools for Assessment (50 Marks)						
Analytical Skill	Lab Performance	Inference	Test I	Test II	Observation	Total
8	8	8	10	10	6	50

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	M	M	H	H	M	-	L	L	L	H	H	H	L
CO2	M	M	H	H	H	-	H	H	L	H	H	H	H
CO3	M	M	H	H	-	-	L	L	-	H	H	M	L
CO4	M	M	H	H	M	-	L	L	-	H	M	L	L
CO5	M	M	H	H	-	-	L	L	-	M	H	L	L
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U3FRA202	Allied Paper II - Instrumental Techniques I		
Semester : II	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	To learn the fundamental principles of various instruments used in Forensic Science lab		
Course Category	Employability		
Development Needs	Global		
Course Description	Instrumental techniques are fundamental to any laboratory analysis. This course is designed to provide an overview of the various analytical tools used in Forensic Labs, especially in chemistry division		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Learn the physics and working of various analytical tools and instruments.	Lecture/Demonstration	Assignment
CO 2	Ability to select suitable instrument for the analysis of a given forensic sample.	Lecture/ Case studies	Case studies
CO 3	Get familiar with molecular analytical methods	Lecture/Demonstration	Seminar
CO 4	Learn the techniques used in elemental profiling.	Lecture/Video lecture	Quiz
CO 5	Interpret results of various instruments for qualitative and quantitative estimation.	Lecture/Demonstration	Assignment

Offered by	Forensic Science

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**General Physical Concepts :** Concept of electromagnetic radiation, Light as wave and particle, type of radiation (classification with frequency and wavelength) Interaction between matter and radiation – absorption, emission, reflection, refraction and scattering. Fluorescence and phosphorescence – principle and application in Forensic science. Density gradient analysis and refractive index in Forensic Science.	1	all
		Instructional Hours	**15**
Suggested Learning Methods: **Library extra reading**			
II	**Spectroscopy :** Instrumentation : source, variable (filter) and detector. UV – Visible Spectroscopy : Principle- Beer Lambert's Law and electron transition, working, application and drawbacks. IR Spectroscopy : Principle, instrumentation and application. IR and FTIR. RAMAN Spectroscopy and their applications in Forensic Science.	1	11,12,13
		Instructional Hours	**15**
Suggested Learning Methods: Video lectures			

III	**Atomic Spectroscopy :** Atomic absorption Spectroscopy (AAS) and Atomic Emission Spectroscopy- Principle working, application, drawbacks. X-Ray Diffraction (XRD) : Principles, Working, Application. X-Ray Fluorescence (XRF) – Working, Application and Drawbacks.	1	7,8,9
		Instructional Hours	**15**
Suggested Learning Methods: Hands on training			
IV	**NAA (Neutron Activation Analysis):** Introduction, Basic Theory and Principles, neutron sources, Detection, measurement, and applications. NMR (Nuclear Magnetic Resonance) : Principle, working, instrumentation, application, drawbacks. Differential thermal analysis: Working and application. Concept of electrochemistry : Polarography and voltammetry.	1	7,8,9
		Instructional Hours	**15**
Suggested Learning Methods: Laboratory practice			
V	**Mass Spectrometry** : Principle, Components- Sample inlets- Batch Inlet, probe inlet, direct inlet, chromatographic inlets, Ionization- ionization types and ionization sources- EI, ESI, CI, FAB; vacuum system. Magnetism- mass analyzers- Quadrupole, Time of Flight, Ion trap. Detectors- faraday cup, electron multiplier, Scintillation counter. Interpretation of Mass spectrograph. Applications of mass spectrometry in forensic science.	1	16
		Instructional Hours	**15**
Suggested Learning Methods: Online training			
		Total Hours	**75 Hrs**

Text Books	1. MLA. Skoog, Douglas A. Principles of Instrumental Analysis. Fort Worth: Saunders College Pub., 1992.
Reference Books	1. Lundquist and Curry, Methods in Forensic Science, 1983. 2. Yinon, Forensic Application of Mass Spectrometry, 1994. 3. Borrow, Molecular Spectroscopy, 1980. 4. Moonesens A.A. et al., Scientific Evidence in Criminal Cases, 1973. 5. Gilbert, GC-MS guide to Ignitable Liquids, 1997.

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	-	H	-	H	H	H	-	H	H	-	H
CO2	H	H	-	H	-	H	H	H	-	H	H	-	H
CO3	M	M	-	H	-	H	H	H	-	H	H	-	H
CO4	M	M	-	H	-	H	H	H	-	M	H	-	H
CO5	M	H	-	H	-	H	H	H	-	H	H	-	H

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U3FRC305	Core Paper V - Forensic Physics		
Semester : III	Credits : 4	CIA : 50 Marks	ESE : 50 Marks

Course Objective	To develop the skill to identify and analyse physical evidences.
Course Category	Employability
Development Needs	Global
Course Description	Forensic Physics is the collection of methods that is deployed for the individualisation of physical evidences. The major evidences that analysed in forensic physics are glass, paint, fibre, soil, building materials etc.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Analysis of glass and deduce glass evidences	Lecture/Demonstration	Assignment
CO 2	Ability to individualise soil samples	Lecture/ Case studies	Case studies
CO 3	Compare various paint samples to find put the source.	Lecture/Demonstration	Seminar
CO 4	Restore erased identification marks	Lecture/Video lecture	Quiz
CO 5	Perform quality test for building materials	Lecture/Demonstration	Assignment

Offered by Forensic Science

Course Content **Instructional Hours / Week : 5**

Unit	Description	Text Book	Chapters
I	**Glass** Types of glass and their composition. Forensic examination of glass fractures, Determination of direction of impact: concentric fracture, cone fracture, radial fracture, rib marks, hackle marks, backward fragmentation, Examination of glass: colour, fluorescence, physical matching, density comparison, refractive index, elemental analysis, Interpretation of glass evidence, Case studies related to glass	1	Sec 7
	Instructional Hours		**15**
Suggested Learning Methods: **Video lectures**			
II	**Soil** Formation and types of soil ; Composition and colour of soil, Forensic examination of soil : particle size distribution, turbidity test, microscopic examination, density gradient analysis, ignition loss, differential thermal analysis, elemental analysis. Interpretation of soil evidence. Case studies.	1	Sec 9
	Instructional Hours		**15**
Suggested Learning Methods: Library extra reading			
III	**Paints** Types of paint and their composition, Forensic examination of paints: microscopic and macroscopic studies, Pigment distribution. Micro-chemical analysis, physical matching, solubility test, elemental analysis. Pyrolysis, Cyclic voltammetry, AAS. Chromatographic technique - TLC, Colorimetry. IR spectroscopy, X-ray diffraction; Interpretation of paint evidence. Case studies.	1	Sec 5
	Instructional Hours		**15**
Suggested Learning Methods: Online training			

IV	**Restoration of Erased or Obliterated marks** Method of marking - Cast, Punch and Engrave, Methods of Obliteration, Method of restoration - Etching, Magnetic, Electrolytic. Recording of restored marks on different surfaces. Tyre Marks and Speed determination in accident cases.	1	Sec 6
		Instructional Hours	**15**
Suggested Learning Methods: Laboratory practice			
V	**Building Materials** Types of cement and their composition. Determination of adulterants by physical, chemical and instrumental methods. Examination of brick; Analysis of Bitumen and road material. Analysis of cement mortar, cement concrete and stones.	1	Sec 11,12,13
		Instructional Hours	**15**
Suggested Learning Methods: Hands on training			
		Total Hours	**75**

Text Books	1. Forensic physics Manual by Directorate of Forensic Science, Govt. of India
Reference Books	1. Working Procedure Manual: Physics BPR&D Publication, 2000. 2. R. Saferstein; Forensic Science Handbook, Vol.-I, II, 2004. 3. B. Caddy; Forensic Examination of Glass and Paints Analysis and Interpretation ISBN 0784 05749, 2001. 4. James Michael Curran, Tachia Natilie Hicks and John S. Buckleton; Forensic Interpretation of Glass Evidence, CRC Press, 2000. 5. David A. Crown; the Forensic Examination of Paints and Pigments, Taylor & Francis, NY, 2001
Web. URLs	1. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000016FS/P000694/M014098/ET/1516190217FSC_P7_M6_e-text.pdf 2. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000016FS/P000694/M014079/ET/1456988181FSC_P7_M24_e-text.pdf

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping

CO \PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	M	-	H	L	-	H	H	M	L
CO2	M	H	H	H	M	-	M	L	-	H	H	L	M
CO3	M	H	H	H	M	-	M	L	-	H	H	L	L
CO4	H	H	H	H	M	-	H	L	-	H	H	L	L
CO5	H	H	H	H	M	-	H	L	-	H	H	L	H

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U3FRP306	Core Paper VI - Forensic Physics Practical		
Semester : III	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	Learn the techniques of analysing various physical evidences.		
Course Category	Employability		
Development Needs	Global / National		
Course Description	Forensic Physics practical deals with examinations and comparisons of various physical evidences based on their physical attributes viz. density, refractive index, resistivity, temperature, luminescence, elasticity and composition. The physical evidences that are examined are paint, glass, soil, fibres, metallic pieces, threads, ropes, knots and obliterated marks.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To learn the forensic examination of the physical nature of various samples such as soil, paint etc.	Demonstration / Video Lessons	Practical
CO 2	Learn to restore erased marks from metal surfaces.	Demonstration	Practical
CO 3	Determine the preliminary examination of physical samples for quick elimination	Demonstration / Video Lessons	Practical
CO 4	Handle simple and compound microscope effectively	Demonstration / Video Lessons	Practical
CO 5	Perform Microscopic examination of fibre and paint.	Demonstration / Video Lessons	Practical

Offered by	Forensic Science
Course Content	Instructional Hours / Week : 4

S. No.	Experiment
1	Density gradient analysis of soil samples.
2	Microscopic examination of various fibers.
3	Restoration of erased identification marks.
4	Determination of refractive index of glass and liquids.
5	Comparison of broken Glass bangles.
6	Physical matching of broken pieces of different objects.
7	Comparison of strings/ threads/ropes.
8	Physical / Chemical analysis of Paint samples.
9	Comparison of Tool marks.
10	Comparison of paint chips under microscope.
	TOTAL 60 Hours

Tools for Assessment (50 Marks)						
Analytical Skill	**Lab Performance**	**Inference**	**Test I**	**Test II**	**Observation**	**Total**
8	**8**	**8**	**10**	**10**	**6**	**50**

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	H	M	-	H	-	-	H	H	M	M
CO2	H	H	L	H	M	-	H	-	-	H	H	M	M
CO3	H	H	L	H	M	-	H	-	-	H	H	M	M
CO4	H	H	-	H	M	-	M	-	-	H	H	M	H
CO5	H	H	-	H	M	-	M	-	-	H	H	M	H

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U3FRA303	Allied Paper III - Forensic Biology		
Semester : III	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	To learn the various analytical tools involved in the forensic analysis of biological samples.		
Course Category	Employability		
Development Needs	Global		
Course Description	Forensic Biology deals with the analysis of evidences such as plants, insects, water animals and wild animals.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Have a clear idea about the scope of forensic biology.	Lecture/Demonstration	Assignment
CO 2	Systematic collection and scientific analysis of hair and fibre.	Lecture/ Case studies	Case studies
CO 3	Understand the forensic significance of plants.	Lecture/Demonstration	Seminar
CO 4	Calculate the time of death from insect growth.	Lecture/Video lecture	Quiz
CO 5	Understand and analyse wild life related cases.	Lecture/Demonstration	Assignment

Offered by Forensic Science

Course Content **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	**Introduction to Forensic Biology** History and scope, divisions. Nature and importance of biological evidences. Fundamentals of Biology, Biochemistry and its importance in Forensic Biology. Importance of Forensic Anthropology & Odontology, Forensic Serology. Collection, preservation and packaging of biological evidences.	1	1
		Instructional Hours	**12**
Suggested Learning Methods : **Library extra reading**			
II	**Hair and Fibres** Hair - structure of human hair : Inner and Outer morphology, biochemistry of hair and growth stages. Comparison of human and animal hair : medulla, Medullary index calculation, Cuticle examination. Fibre - Classification : Natural, Semi-synthetic and synthetic fibres and their properties. Structure analysis for different types of fibres and their Forensic significance	1	2
		Instructional Hours	**12**
Suggested Learning Methods : Hands on Training			

III	**Botanical Evidences** Wood : Structure and Properties. Types, Identification with Forensic Importance. Leaves : Morphology, types based on arrangement and venation with structures and examples. Pollen : Structure, function, Reproduction and Forensic importance. Diatoms : Location, Structure, types, reproduction identification and Forensic Significance. Limnology : Scope, Forensic Analysis of diatoms.	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Library extra reading			
IV	**Entomology** Introduction, areas and importance. General anatomy of arthropod. Insects of Forensic significance : Order- dipteral, Coleoptera, collembola etc. Estimation of time since death and insect succession. Collection, packing and preservation of entomological evidence.	1	4
		Instructional Hours	**12**
Suggested Learning Methods : Video lectures			
V	**Wild life Forensics** Introduction, History and Importance. Laws related to wildlife protection. Wild life protection Act : History, importance and supporting acts and laws. Red data book and wildlife crimes. Pug Marks : features and methods for collection. Methods of analysis to identify : species, gender, age, individual characters from pug marks. Wild life DNA data base. Ornithology and its application.	1	5
		Instructional Hours	**12**
Suggested Learning Methods : Library extra reading			
		Total Hours	**60**

Text Books	1. Forensic Biology notes compiled by the department of Forensic Science, Nehru Arts and Science College Coimbatore
Reference Books	1. Forensic Biology, S. Chowdhuri, BPRD, New Delhi (1971) 2. Forensic Science Handbook, R. Saferstein, Vol III, Prentice Hall, New Jersey (1993) 3. Criminalistics and Scientific Investigation, Peter B Piaza, Frederick Cunliffe. 4. Forensic Science in Wildlife Investigation, Taylor & Francis (2009)
Web. URLs	1. https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==

Tools for Assessment (50 Marks)						
CIA I	**CIA II**	**CIA III**	**Assignment**	**Seminar**	**Quiz**	**Total**
8	**8**	**10**	**8**	**8**	**8**	**50**

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	L	M	L	M	-	L	M	-	L
CO2	H	H	H	L	M	M	M	L	-	H	H	H	H
CO3	M	H	L	L	-	M	M	L	-	H	L	-	L
CO4	M	H	L	H	-	M	H	L	-	H	M	M	M
CO5	M	H	H	H	H	M	M	L	-	H	H	-	M

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U4FRS301	Skill Based Paper I - Introduction to Digital Evidences		
Semester : III	Credits : 3	CIA : 30 Marks	ESE : 45 Marks
Course Objective	Gain an overview of digital forensics and digital evidence and understand the best practices in dealing with electronic evidences.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	Digital Forensics is a science of finding evidence from digital media like a computer, mobile phone, server, or network and the process of preservation, identification, extraction and documentation of computer evidence which can be used by the court of law.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Become familiar with the concept of digital forensics and cyber threats	Lecture/Demonstration	Assignment
CO 2	Understand the various digital forensic investigation methods	Lecture/Demonstration	Case studies
CO 3	Gain basic ideas of operating system and network forensics	Lecture/ Case studies	Seminar
CO 4	Understand the threats associated with mobile devices.	Lecture/Video lecture	Quiz
CO 5	Acquire knowledge in emerging trends in digital Forensics	Lecture/Demonstration	Assignment

Offered by	Forensic Science

Course Content	Instructional Hours / Week : 3

Unit	Description	Text Book	Chapters
I	**Introduction to Digital Evidence** Overview of digital evidence and its importance in investigations Types of digital evidence : computer, mobile devices, cloud, and social media, Legal and ethical considerations in collecting, analyzing, and presenting digital evidence.	1	all
		Instructional Hours	**9**
Suggested Learning Methods : **Library extra reading**			
II	**Fundamentals of Digital Forensics** Principles of digital forensics : preservation, identification, extraction, documentation, and analysis, Tools and techniques used in digital forensics investigations, Chain of custody and its importance in digital forensics.	1	4
		Instructional Hours	**9**
Suggested Learning Methods : Library extra reading			

III	**Operating Systems and File Systems** Introduction to operating systems and file systems, Types of file systems : FAT, NTFS, EXT, and HFS, Analysis of file systems : data carving, file headers, and footers. Network Forensics : Introduction to network forensics and its importance, Packet analysis and its role in network forensics, Tools used in network forensics	1	5,6,7
		Instructional Hours	**9**
Suggested Learning Methods : Online training			
IV	**Mobile Devices and social media forensics** Introduction to mobile device forensics, Types of mobile devices: smartphones, tablets, and wearable devices. Tools and techniques used in mobile device forensics. Cloud and Social Media Forensics; Introduction to cloud and social media forensics, Types of cloud and social media platforms, Tools and techniques used in cloud and social media forensics.	1	9,10
		Instructional Hours	**9**
Suggested Learning Methods : Hands on training			
V	**Emerging Trends in Digital Evidence** Introduction to emerging trends in digital evidence : Internet of Things, Artificial Intelligence, and Blockchain. The impact of emerging trends on digital forensics investigations. Future of digital evidence and digital forensics.	1	12
		Instructional Hours	**9**
Suggested Learning Methods: Video lectures			
		Total Hours	**45**

Text Books	1. "Digital Forensics: Principles and Practices" by Niranjan Reddy, K. Srinivas, and V. Kamakshi Prasad
Reference Books	1. Digital Forensics and Cyber Crime: Second International ICST Conference, ICDF2C 2010, Abu Dhabi, United Arab Emirates, October 4-6, 2010, Revised Selected Papers" edited by Pavel Gladyshev and Marcus K. Rogers 2. "Handbook of Digital Forensics and Investigation" edited by Eoghan Casey 3. "Cyber Crime and Digital Evidences: Indian Perspective" by S. C. Lakhotia and Abhishek Kumar 4. "Digital Evidence and Computer Crime: Forensic Science, Computers and the Internet" by Eoghan Casey
Web. URLs	1. What Is Digital Forensics: Process, Tools, and Types | Computer Forensics Overview | RecFaces

Tools for Assessment (30 Marks)						
CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	7	5	5	5	30

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	L	-	-	H	M	M	L	-	L	L	L	H
CO2	H	L	-	H	H	M	H	L	-	H	H	H	H
CO3	H	L	-	L	H	M	M	L	-	M	L	M	H
CO4	H	L	-	L	H	M	M	L	-	M	L	H	H
CO5	H	-	M	M	H	H	M	H	-	M	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title	
22U4FR3ED1	Skill Based Open Elective Course Extra Departmental Course : I - Fundamental Due Diligence	
Semester : III	Credits : 2	ESE : 50 Marks

Course Objective	Due diligence is next level forensic science in which the course has an objective of training forensic scientists in preventing potential crimes.
Course Category	Employability
Development Needs	Global
Course Description	When it come to crimes, private sector focuses more on preventing it from happening. Due diligence looks forward to techniques to prevent crimes from happening.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Examine the concept of legal due diligence	Lecture	Assignment
CO 2	Understand the concepts of Financial Due Diligence	Lectures/ Tutorials	Seminar
CO 3	To gain knowledge about the operational Due diligence	Lecture/Demonstration	Quiz
CO 4	Understand ESG Analysis and Risk Assessment	Power point presentation	Activity
CO 5	Acquire basic idea about Due Diligence Process and Best Practices	Video lectures/Tutorials	Assignment

Offered by | **Forensic Science**

Course Content | **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Legal Due Diligence** Definition and importance of Due Diligence, Types of Due Diligence. Corporate Structure and Governance, Compliance with Laws and Regulations, Contracts and Agreements, Intellectual Property, Litigation and Dispute.	1	1
	Instructional Hours		**6**
Suggested Learning Methods: **Library extra reading**			
II	**Financial Due Diligence** Financial Statements Analysis, Cash Flow Analysis, Projections and Forecasts, Valuation Methods, Key Performance Indicators.	1	2
	Instructional Hours		**6**
Suggested Learning Methods: PowerPoint presentation			
III	**Operational Due Diligence** Business Model and Strategy, Industry and Market Analysis, Customer Base and Revenue Streams, Operations and Supply Chain, Human Resources and Management.	1	3
	Instructional Hours		**6**
Suggested Learning Methods: Video lectures			

IV	**ESG Analysis and Risk Assessment** Environmental Impact Assessment, Social and Community Impact Assessment, Governance and Ethics Assessment, Due Diligence Report Structure and Content, Risk Assessment and Mitigation Strategies, Due Diligence Checklist and Templates.	1	4
		Instructional Hours	**6**
Suggested Learning Methods: Library extra reading			
V	**Due Diligence Process and Best Practices** Due Diligence Process Steps, Team Structure and Roles, Due Diligence Best Practices and Lessons Learned, Case Studies and Examples.	1	5
		Instructional Hours	**6**
Suggested Learning Methods: PowerPoint presentation			
		Total Hours	**30**

Text Books	1. Notes compiled by the department of Forensic Science, Nehru Arts and Science College, Coimbatore
Reference Books	1. Due Diligence: An M&A Value Creation Approach by William J. Gole and Paul J. Hilger 2. The Art of Due Diligence by Barbara L. Koenig 3. Due Diligence Handbook: Corporate Governance, Risk Management and Business Planning by Leo F. Dalton

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	H	-	M	L	L	M	H	-	H	H	H	-
CO2	-	H	-	M	L	L	M	H	-	H	H	M	-
CO3	-	H	-	M	L	L	M	H	-	H	H	H	-
CO4	-	H	-	M	L	L	H	H	-	H	H	H	-
CO5	-	H	-	M	L	L	M	H	-	H	H	H	-

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title	
22U4FR3ED2	Skill Based Open Elective Course Extra Departmental Course : II - Introduction to Jurisprudence	
Semester : III	Credits : 2	ESE : 50 Marks

Course Objective	Jurisprudence gives an overview and a much more in depth knowledge of or skill in law and the role of law in society.
Course Category	Knowledge
Development Needs	National
Course Description	Jurisprudence explores the concept of law in a logical and philosophical manner. Jurisprudence deals with legal reasoning, legal institutions and legal systems.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the meaning of jurisprudence and sources of law.	Lecture	Assignment
CO 2	Understand the concepts of legals rights and obligations	Lectures/ Tutorials	Seminar
CO 3	Acquire knowledge about the legal persons and properties	Lecture/Demonstration	Quiz
CO 4	Understand the Constitutional laws and Human Rights	Tutorial / Case Studies	Activity
CO 5	Learn the Contemporary Issues in Jurisprudence	Video lectures / Tutorials	Assignment

Offered by Forensic Science

Course Content **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Introduction to Jurisprudence and Sources of Law** Definition and scope of jurisprudence, Historical development of jurisprudence in India, Schools of jurisprudence: Natural Law, Legal Positivism, Historical School and Realism. Classification of sources of law: primary and secondary sources. Statutory interpretation and the role of the judiciary. Customary law and its recognition in Indian legal system	1	2
	Instructional Hours		**6**
Suggested Learning Methods: **Library extra reading**			
II	**Legal Rights, Obligations, and Concepts** Concept of legal rights and obligations, Types of legal rights: fundamental rights, legal rights, and human rights, Relationship between rights and duties. Legal concepts: justice, equality, liberty, and rights. Theories of punishment: retribution, deterrence, and rehabilitation Theories of law: analytical, sociological, and natural law.	1	3
	Instructional Hours		**6**
Suggested Learning Methods: PowerPoint presentation			

III	**Legal Persons and Property** Definition and types of legal persons: natural, artificial, and juristic persons. Types of property: movable, immovable, tangible, and intangible. Acquisition, transfer, and devolution of property in Indian law	1	4,5
		Instructional Hours	**6**
Suggested Learning Methods: PowerPoint presentation			
IV	**Constitutional Law and Human Rights** Historical development of the Indian Constitution, Fundamental rights and duties of citizens, Powers and functions of the judiciary and other organs of the government, Principles of international law and its recognition in Indian legal system, International treaties and their impact on Indian law, Human rights and their recognition in Indian law.	1	7,9
		Instructional Hours	**6**
Suggested Learning Methods: Case Studies			
V	**Contemporary Issues in Jurisprudence** Recent developments in Indian jurisprudence, Intersection of law and technology, Environmental law and sustainability, Corporate social responsibility and business ethics, Law and social justice.	1	8
		Instructional Hours	**6**
Suggested Learning Methods: Video lectures			
		Total Hours	**30**

Text Books	1. Paranjape, N. V. (2014). Jurisprudence. LexisNexis.
Reference Books	1. Mahajan, V. D. (2016). Jurisprudence and Legal Theory. Eastern Book Company. 2. Paranjape, N. V. (2015). An Introduction to Jurisprudence and Legal Theory. LexisNexis. 3. Verma, S. K. (2019). Jurisprudence and Legal Philosophy. Universal Law Publishing. 4. Singh, A. (2019). Introduction to Jurisprudence and Legal Theory. Eastern Book Company.

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	-	-	-	H	-	-	-	H	-	M	H	-
CO2	M	-	-	-	H	-	-	-	H	-	M	H	-
CO3	M	-	-	-	H	-	-	-	H	-	M	H	-
CO4	M	-	-	-	H	-	-	-	H	-	M	H	-
CO5	M	-	-	-	H	-	-	-	H	-	M	H	-

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U3FRC407	Core Paper VII - Biometrics and Impression Analysis		
Semester : IV	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	To impart knowledge and skill of developing and identifying individual based on biometrics and other impressions.		
Course Category	Employability		
Development Needs	Global		
Course Description	Biometric impressions are unique to every individual. By learning proper techniques to develop and compare them, students will be able to identify the potential culprit behind crimes.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Locate, identify, develop, preserve and compare footwear impression.	Lecture/Demonstration	Assignment
CO 2	Locate, identify, develop, preserve and compare various biometric impression.	Lecture/ Case studies	Case studies
CO 3	Have a strong idea about the formation and science behind fingerprints.	Lecture/Demonstration	Seminar
CO 4	Locate, identify, develop, preserve and compare fingerprints	Lecture/Video lecture	Quiz
CO 5	To analyse bite marks for its forensic significance.	Lecture/Demonstration	Assignment

Offered by Forensic Science

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapters
I	**Footwear Impressions** Introduction, Forms of footwear impressions, Information from footwear impressions, Location and recovery of footwear impressions, Enhancement Methods, Preparation of Exemplars, The examination process, Case histories. Lip Prints- Introduction, Classification, History, Scope, Application in crime detection	1	1
	Instructional Hours		**15**
Suggested Learning Methods: **Library extra reading**			
II	**Miscellaneous prints** Ear Prints- Introduction, History, Ear prints Morphology of ear, ear print location, Producing standards from suspects, Identification and comparison. Palm print; Introduction, History, Scope, Application in crime detection, preservation and lifting of various prints, Present of expert evidence in court, Judicial acceptance of miscellaneous prints. Tyre marks - Development, comparison and forensic significance.	1	2
	Instructional Hours		**15**
Suggested Learning Methods: Hands on training			

III	**Fingerprints** Introduction, History and development of fingerprints, Structure of skin, Elements of fingerprinting: ridge patterns, ridge characteristics, Poroscopy. Classification of fingerprint patterns: single fingerprint classification, Henry system of classification (Primary to tertiary and key classification), extension of Henry system of classification. AFIS: Introduction, History, Operations, Search technology, Administration and networking, Advantages. Basics of taking inked prints, taking inked prints of living and dead: Plain and rolled prints, other devices and material for recording prints.	1	3
		Instructional Hours	**15**
Suggested Learning Methods: Video lectures			
IV	**Fingerprint as evidence** Types of evidentiary fingerprints. Development of latent fingerprints: Physical and chemical methods. Development techniques on porous and non-porous surfaces, Development on adhesive surface, Development with blood and grease contamination. Development of latent fingerprints on dead body. Visualization methods of illumination. Photography, Preservation and lifting of fingerprints. Digital imaging of fingerprint: processing of fingerprints and their enhancement.	1	4
		Instructional Hours	**15**
Suggested Learning Methods: Laboratory practice			
V	**Bite Marks** Introduction, History, Scope, Application in crime detection. Preservation and lifting of various prints. Present of expert evidence in court. Judicial acceptance of miscellaneous prints. Forensic significance of retinal scan and gait pattern.	1	5
		Instructional Hours	**15**
Suggested Learning Methods: Online training			
		Total Hours	**75**

Text Books	1. Biometrics notes compiled by the Department of Forensic Science
Reference Books	1. Mehta, M.K; Identification of Thumb impression & cross examination of Fingerprints 2. Chatterjee, S.K; Speculation in Fingerprint Identification, Jantralekha printing Works, Kolkata, 1981. 3. Cowger James F; Friction Ridge Skin- Comparison &Identification of Fingerprints, CRC Press, NY, 1993
Web. URLs	1. https://www.ojp.gov/pdffiles1/nij/225320.pdf

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	H	H	H	-	-	M	L	-	H	H	-	-
CO2	H	H	H	H	-	-	H	L	-	H	H	-	-
CO3	H	H	H	H	M	-	L	L	-	H	M	M	-
CO4	H	H	H	H	-	-	M	L	-	H	H	-	-
CO5	H	H	H	H	-	-	H	L	-	H	H	-	-
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U3FRP408	Core Paper VIII - Biometrics and Impression Analysis Practical		
Semester : IV	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	The students will understand & perform experiments relating to Identifying fingerprints, their patterns, footprints, tyre marks, lip prints which can be used to establish the identity of a person.		
Course Category	Employability		
Development Needs	Global		
Course Description	Scientific biometric tools and its applications can be used to establish human identity. By learning proper techniques to develop and compare biometrics, students will be able to identify the potential culprit behind crimes.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Learn to search and develop fingerprints from various surfaces using different methods	Demonstration / Video Lessons	Practical
CO 2	Learn to identify fingerprint patterns	Demonstration	Practical
CO 3	Understand the system of fingerprint classification	Demonstration / Video Lessons	Practical
CO 4	Develop footprints and tyre impressions	Demonstration / Video Lessons	Practical
CO 5	Unique identification of a person based on lip prints	Demonstration / Video Lessons	Practical

Offered by	Forensic Science
Course Content	Instructional Hours / Week : 4

S. No.	Experiment
1	To take plain and rolled inked fingerprints in FBI card and to identify patterns.
2	Search for fingerprints from a suspected scene/object
3	To perform ridge counting and whorl tracing from a given fingerprint sample.
4	Classification of fingerprints using Henry Ten Digit System.
5	Development of fingerprints from porous/ non-porous surface using powdering method.
6	Development of fingerprints from porous/ non-porous surface using chemical methods.
7	Development of footprints from mud.
8	Development of tyre impressions.
9	Development of lip prints.
10	Comparison of fingerprint using ridge characteristic or minutiae from a given fingerprint samples.
	TOTAL 60 Hours

Tools for Assessment (50 Marks)							
Analytical Skill	Lab Performance	Inference	Test I	Test II	Observation	Total	
8	8	8	10	10	6	50	

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	L	-	M	-	-	H	H	M	-
CO2	H	H	L	H	L	-	M	-	-	H	H	M	-
CO3	H	H	L	H	M	-	M	-	-	H	H	M	-
CO4	H	H	M	H	L	-	H	-	-	H	H	M	-
CO5	H	H	H	H	M	-	M	-	-	H	H	M	-

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U3FRA404	Allied Paper IV - Instrumental Techniques - II		
Semester : IV	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	To impart knowledge and skill of handling various instruments that are commonly used in forensic science.		
Course Category	Employability		
Development Needs	Global		
Course Description	Instruments are basic tools used in every analytical science. This course is designed to provide in depth theoretical knowledge about the various instruments used in forensic labs.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the working of various instruments.	Lecture/Demonstration	Assignment
CO 2	To choose the appropriate instrument for various forensic tests.	Lecture/ Case studies	Case studies
CO 3	To calibrate and use various chromatographic techniques.	Lecture/Demonstration	Seminar
CO 4	To operate various types of microscopes used in forensic science	Lecture/Video lecture	Quiz
CO 5	Have a deep understanding of various immunochemical techniques and its applications	Lecture/Demonstration	Assignment

Offered by	Forensic Science

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	**Basic principles of sampling** Sample preparation: Stock solution, standard solution and serial dilution. Qualitative and quantitative estimation. General Principles of Biological and Biochemical analysis: pH and Buffers, pH Meter, Physiological Solution. Centrifugation: Basic principles of centrifugation, Svedberg's unit, density gradient centrifugation, types of centrifuges (based on size, type of rotors and usage), ultra-centrifugation, refrigerated centrifuges, safety maintenance of centrifuge.	1	1
		Instructional Hours	**12**
Suggested Learning Methods: **Library extra reading**			
II	**Microscopy** Lens systems and its working. Principle of microscopy, Abbe equation - Principle, ray diagrams, working, sample preparation and applications of following in Forensic Science. Simple microscope and Compound microscope, Stereo microscope, Comparison microscope, Phase contrast microscope.	1	2
		Instructional Hours	**12**
Suggested Learning Methods: Video lectures			

III	**Advanced microscopy** Principle, ray diagrams, working, sample preparation and applications of following in Forensic Science : Polarized light microscope, Fluorescent microscope, Infrared microscope, Scanning electron microscope (SEM), Transmission electron microscope (TEM), Atomic force microscope (AFM).	1	3
		Instructional Hours	**12**
Suggested Learning Methods: Hands on training			
IV	**Chromatography** Chromatography: General principles of chromatography, Classification - Paper chromatography, Column chromatography, Thin Layer Chromatography (TLC), High Performance Thin Layer Chromatography (HPTLC). Concept of mutual miscibility and preparation of mobile phase. Liquid Chromatography (LC), High Performance Liquid Chromatography (HPLC), Liquid Chromatography - Mass Spectrometry (LC-MS), Gas Chromatography (GC), Gas Chromatography- Mass Spectrometry (GC-MS).	1	4
		Instructional Hours	**12**
Suggested Learning Methods: Laboratory practice			
V	**Immuno-chemical Techniques and electrophoresis** General principles and introduction to antigen and antibody, Antigen-antibody reaction, precipitin reaction, production of antibodies. Enzyme Assay Techniques: Visible and UV spectrophotometry methods, ELISA, Automated enzyme analysis, Immobilized Enzymes, Fluorescence Immuno-assay. Electrophoresis. General Principle, factors affecting electrophoresis, Horizontal and vertical electrophoresis, SDS, PAGE, cross over electrophoresis, capillary electrophoresis.	1	5
		Instructional Hours	**12**
Suggested Learning Methods: Online training			
		Total Hours	**60**

Text Books	1. Notes compiled by the department of Forensic Science, Nehru Arts and Science College, Coimbatore.
Reference Books	1. Peterson, Clinical and Forensic Application of Capillary Electrophoresis, 2001. 2. Willard, H.H., Instrumental Methods of Analysis, 1974. 3. Wilson, K. and Goulding, K.H., A Biologists guide to Principles and Techniques of Practical Biochemistry, 1991 4. Howard, Forensic Analysis by Gas Chromatography, 2012
Web. URLs	1. https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	M	L	-	H	-	M	M	-	-	H	H	-	H
CO2	H	M	-	H	-	M	M	-	-	H	H	-	H
CO3	H	L	-	H	-	M	M	-	-	H	H	-	H
CO4	H	M	-	H	-	M	M	-	-	H	H	-	H
CO5	H	M	-	H	-	M	H	-	-	H	H	-	H
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U4FRS402	Skill Based Paper II - Research methodology and Statistics		
Semester : IV	Credits : 3	CIA : 30 Marks	ESE : 45 Marks
Course Objective	Develop foundational knowledge of qualitative and quantitative research methods, evaluation of research and applying statistical applications to relevant research data.		
Course Category	Skill Development		
Development Needs	Global/ International		
Course Description	Research methodology is the logical, systematic plan to resolve a research problem and Statistics is a branch of science that deals with collection, organization and analysis of data from the sample to the whole population.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Familiarize with basic of research and the research process.	Lecture	Assignment
CO 2	Choose the appropriate research design and develop appropriate research hypothesis for a research project	Lecture/Demonstration	Seminar
CO 3	Learn various data collection methods	Lecture/Demonstration	Quiz
CO 4	Describe the appropriate statistical methods required for a particular research design	Lecture/Demonstration	Assignment
CO 5	Choose the right statistical technique to be used with the research method	Lecture	Case studies

Offered by	Forensic Science
Course Content	Instructional Hours / Week : 3

Unit	Description	Text Book	Chapters
I	**Introduction to Research** Research: Definitions, Characteristics and Objective of research- Epistemology and ontology of research, Types of research: Descriptive vs. Analytical, Applied vs. Fundamental, Qualitative vs. Quantitative, Conceptual vs. Empirical, and other kinds of research. Research methods vs Research Methodology, Inductive and deductive research, Ethics in Criminal Justice Research.	1	all
		Instructional Hours	**9**
Suggested Learning Methods: **Library extra reading**			
II	**Research Problem** Formulation of the research problem, Research process, Overview of the stages in research (hypothesis formation to analysis and report writing), Research design: Meaning of research design, Need for research design, Hypothesis: Definition, Types of hypothesis.	1	4,5
		Instructional Hours	**9**
Suggested Learning Methods: Library extra reading			

III	**Data collection** Types of Data's, Modes of collection of primary data: Observation, Interviews, interview schedules, Questionnaires, Modes of collection of secondary data. Population and unit of analysis, Sampling Techniques: Definition, Criteria for selecting a sampling design, Types of sampling: Probability sampling and non-probability sampling, Types of probability sampling: simple random sampling, systematic sampling, stratified sampling, cluster sampling, area sampling and multi-stage sampling, Types of nonprobability sampling: purposive sampling, convenience sampling, judgment sampling and snowball sampling. Advantages of sampling, Requirements of a good sample.	1	6,7,8
		Instructional Hours	**9**
Suggested Learning Methods: Group activity			
IV	**Introduction to Statistics** Variables; Discrete and Continuous, Independent and Dependent. Scales of measurement -Nominal, ordinal, Interval and ratio. Frequency for grouped and ungrouped data, Class Interval and Class width, Continuous and discontinuous data, Graphical representation of data, bar chart, pie-chart and histogram, Significance of statistics in forensic science.	1	13,14
		Instructional Hours	**9**
Suggested Learning Methods: Problem solving			
V	**Measures of Central Tendency** Measures of Central Tendency: Mean, Median and Mode-Measures of Dispersion: Range, quartile deviation, mean deviation and standard deviation and coefficient of variations. Measure of symmetry: Kurtosis and skewness- Introduction to Statistical Package for Social Science Research (SPSS).	1	15
		Instructional Hours	**9**
Suggested Learning Methods: Problem solving			
		Total Hours	**45**

Text Books	1. Kothari, C. R. (1996). Research methodology: Methods & techniques (2nd ed.). New Delhi: Wiley Eastern.
Reference Books	1. Agarwal, B. (2012). Basic statistics. Tunbridge Wells: Anshan. 2. Argyrous, G. (2000). Statistics for social science research: With a guide to SPSS. London: SAGE. 3. Gupta, S. P. (2008). Statistical methods. New Delhi: Sultan Chand & Sons. 4. Leabo, D., & Smith, C. (1968). Basic statistics (3rd ed.). Homewood, Illinois: R. D. Irwin
Web. URLs	1. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/law/09._research_methodology/01._basics_of_research/et/8148_et_et.pdf 2. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/law/09._research_methodology/17._research_ethics/et/5800_et_17_et.pdf

Tools for Assessment (30 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	7	5	5	5	30

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	M	-	-	-	-	H	-	H	-	-	-	H	-
CO2	L	H	-	-	-	H	-	H	-	-	-	M	-
CO3	L	H	-	-	-	H	-	H	-	-	-	H	-
CO4	M	H	-	-	-	H	-	H	-	-	-	M	-
CO5	M	H	-	-	-	H	-	H	-	-	-	H	-
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U3FRC509	Core Paper IX - Serology and DNA Typing		
Semester : V	Credits : 4	CIA : 50 Marks	ESE : 50 Marks

Course Objective	To impart knowledge and skill for analysing human biological samples.
Course Category	Employability
Development Needs	Global
Course Description	Forensic Serology involved the methods of identifying the person under question by means of biological analysis. This involves a two-step process. First step is the serological analysis and the second step is the DNA analysis.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Collect, preserve and analyse body fluids.	Lecture/Demonstration	Assignment
CO 2	Extract DNA from biological sample.	Lecture/ Case studies	Case studies
CO 3	Compare DNA using markers for various identifications.	Lecture/Demonstration	Seminar
CO 4	Perform chemical tests for body fluids	Lecture/Video lecture	Quiz
CO 5	Identify and individualise blood samples	Lecture/Demonstration	Assignment

Offered by Forensic Science

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapters
I	**Biological Evidences** Collection, packing and preservation of biological evidences. Preservatives used in biological evidences. Bioterrorism and bio war, use of locust as a bioweapon, microbial forensics.	1	1
		Instructional Hours	**15**
Suggested Learning Methods: **Library extra reading**			
II	**Blood and its function** Human Blood: composition, functions. Collection, packaging and preserving techniques. Grouping : General Principles, theory of their inheritance, Blood group determination from fresh blood, titer, Raulax formation and Bombay blood group. Definition of antigen and antibody, Various antigen-antibody reactions, Difference between precipitation, agglutination and flocculation. Immunochemical techniques : principle, function and forensic significance.	1	2
		Instructional Hours	**15**
Suggested Learning Methods: Laboratory practice			

III	**Forensic Examination of Body fluids** Analysis of blood : identification, confirmatory for fresh blood stains. Takayama and Teichmann test for dried blood stains. Identification of blood group from stain of blood, Semen, saliva and sweat : absorption elution, absorption inhibition and mixed agglutination. Semen : location, collection, packing, evaluation and tests for identification and forensic significance. Urine : location, collection, packaging, preservation, evaluation and tests for identification and forensic significance. Forensic significance of other body fluids like sweat, saliva, milk and its collection and identification.	1	3
		Instructional Hours	**15**
Suggested Learning Methods: Hands on training			
IV	**Introduction to Human Genetics** Human genetics - definition and explanations for Heredity, alleles, mutations and population genetics. Molecular biology of DNA, variations in DNA, Biochemical aspects. Genomics and medical genetics. Mitochondrial DNA - definition, structure, biochemical activity. DNA Profiling **:** Introduction, definite ion, history and importance in the field of forensic science. Paternity and maternity index : equation, derivation and calculation.	1	4
		Instructional Hours	**15**
Suggested Learning Methods: Video lectures			
V	**DNA Profiling** DNA typing systems - Polymorphism, RFLP analysis, PCR amplifications, sequence polymorphism. Analysis and functioning of SNP and Y- STR, Evaluation of results, frequency estimate calculations, allele frequency determination, Interpretations of results. Match probability - database, quality control, certification and accreditation. Forensic Significance of DNA profiling : Applications in disputed paternity cases, child swapping. Missing person's identity, civil immigration, job disputes. Case studies related to paternity and maternity disputes and child swapping. Legal standards for admissibility of DNA profiling.	1	5
		Instructional Hours	**15**
Suggested Learning Methods: Online training			
		Total Hours	**75**
Text Books	1. Forensic Serology notes compiled by the department of Forensic Science, Nehru Arts and Science College, Coimbatore.		

Reference Books	1. DNA Structure and functions by Richard R. Sinden; Academic Press, Inc. 1994. 2. DNA Profiling and DNA fingerprinting; Edited by Jorg T. Epplen and Thomas Lubjuhn; Birkhauser Verlag, Switzerland, 1999. 3. Modi, J.K. (1988): Medical Jurisprudence and Toxicology, N.M. Tripathi Pvt. Ltd. 4. Fraser, Roberts J.A (1965): An introduction to Medical Genetics. 5. Chatterjee, C. C- (1975): Human Physiology.
Web. URLs	1. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000016FS/P000699/M011528/ET/1516257136FSC_P12_M2_e-text.pdf 2. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000016FS/P000699/M011539/ET/1516257484FSC_P12_M13_e-text.pdf 3. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000016FS/P000699/M011530/ET/1516257192FSC_P12_M4_e-text.pdf

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping

CO\ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	H	H	M	-	L	-	-	H	H	-	M
CO2	M	H	M	H	L	-	M	-	-	H	H	-	L
CO3	M	H	L	H	M	-	L	-	-	H	H	M	M
CO4	M	H	M	H	L	-	M	-	-	H	H	-	L
CO5	M	H	H	H	M	-	M	-	-	H	H	-	L

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U3FRC510	Core Paper X - Forensic Toxicology		
Semester : V	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	Develop knowledge and skill for the analysis of forensic toxicological samples		
Course Category	Employability		
Development Needs	Global		
Course Description	Toxicology is the study of the action of poisons in the body. Forensic Toxicology deals with the identification of cause of death based on the analysis of body samples for various poisons.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Know the biological action of various toxins inside body.	Lecture/Demonstration	Assignment
CO 2	Extract and isolate toxins.	Lecture/ Case studies	Case studies
CO 3	Provide first aid in toxicology related cases.	Lecture/Demonstration	Seminar
CO 4	Collect, pack and preserve toxicological evidences.	Lecture/Video lecture	Quiz
CO 5	Study the metabolism and extraction of common poisons in the body	Lecture/Demonstration	Assignment

Offered by	Forensic Science

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Introduction to Forensic Toxicology** Forensic toxicology: Introduction, Role of the toxicologist, significance of toxicological findings- Poisons, definition, classification on the basis of their origin, physiological action and chemical nature, types of poisoning- Modes of administration- Signs and symptoms of poisoning, its effect on vital functions- Medico legal and post-mortem findings and report writing.	1	11
	Instructional Hours		**15**
Suggested Learning Methods: **Library extra reading**			
II	**Drugs and its actions** Drugs: definition, classification and scope and forensic importance- Commonly consumed drugs, their mode of actions, symptoms, street names, methods of consumption- Analysis of drugs: chemical and instrumental. Spot tests and qualitative analysis- Importance of physical and biochemical instrumentation in the field of dug analysis.	1	21
	Instructional Hours		**15**
Suggested Learning Methods: Video lectures			

III	**Extraction, Collection and Analysis of Toxins** Extraction, isolation and clean up procedures: conventional and modern techniques. Application of chromatography for the separation of poison and drugs. Spectrophotometric techniques for the quantification of poisons and drugs- Examination of metallic poisons, snake venom, insect bites.	1	14
		Instructional Hours	**15**
Suggested Learning Methods: Laboratory practice			
IV	**Introduction to Pharmacology** Forensic pharmacology: definition, introduction- Absorption, distribution, metabolism, pathways of drug metabolism, drug metabolism and drug toxicity-Population and clinical pharmacokinetics and bio analytical techniques.	1	17
		Instructional Hours	**15**
Suggested Learning Methods: Video lectures			
V	**Collection of Evidences and Report Writing** Management of Toxicological cases in the hospital: Signs and symptoms of common poisons, antidotes and Stomach washing- Collection and preservation of viscera for various types of poisons: Choice of preservatives, containers and storage- Report writing in toxicological cases.	1	25
		Instructional Hours	**15**
Suggested Learning Methods: Hands on training			
		Total Hours	**75**

Text Books	1. Narayana Reddy K.S, Introduction to Forensic Medicine and Toxicology, 13th edition.
Reference Books	1. Modi's: Medical Jurisprudence & Toxicology, M. M. Trirathi Press Ltd. Allahabd, 1988. 2. S.N. Tiwari: Analytical Toxicology, Govt. of India Publications, New Delhi, 1987. 3. Saferstein, R: Forensic Science Hand Book, Vol I, II and III, Pretince Hall, NI, 1982. Saferstein, R: Criminalistics, 2002. 4. O Hara &Osterburg : Introduction to Criminalistics, 1949
Web. URLs	1. https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	M	M	H	H	L	M	-	-	-	H	H	-	-
CO2	M	H	H	H	L	L	M	-	-	H	H	-	L
CO3	H	M	M	L	L	L	-	L	-	H	H	-	M
CO4	M	H	H	H	L	-	M	-	-	H	H	-	-
CO5	M	H	H	H	L	M	-	-	-	H	H	-	-
H-High; M-Medium; L-Low													

Course designed by	**Verified by**

Course Code	Title		
22U3FRT511	Core Paper XI - Outdoor Training		
Semester : V	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	To make the students competent for physical tests		
Course Category	Skill Development		
Development Needs	National		
Course Description	Police jobs in India demands specific fitness benchmarks. This course id designed to train the learner to develop physical strength in this regard.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Do physical exercises which keep them healthy.	Outdoor Activities	Physical test
CO 2	Do basic drill movements	Outdoor Activities	Physical test
CO 3	Play various games which require physical strength.	Outdoor Activities	Physical test
CO 4	Follow commands properly and coordinate with team mates.	Outdoor Activities	Physical test
CO 5	Showcase lifesaving skills and self defense tactics.	Outdoor Activities	Physical test
Offered by	Forensic Science		

List of activities student must indulge in **Instructional Hours / Week : 5**

1. Drill- Parade, march past, turnings, salute
2. Physical Training
• Running
• Stretching Exercises
• Cardio Training
• Endurance Training
• Muscle Building Exercises (Push-ups, Sit-ups, Chin-ups, etc.)
3. Yoga
4. Self Defense Training
5. Swimming
6. Games

Internal evaluation

The students need to perform the Parade individually and, in the contingent, to make sure the effective assessment of Drill movements and synchronization within the contingent.

External Evaluation

Students' progress in learning drill movements and march past will be assessed both individually and as part of contingent.

Apart from the Parade students' performance will also be measured in terms of physical activity tests such as Running700 meters, push-ups, sit-ups and Chin-ups.

A person with substantial experience in outdoor training and Parade will be invited as the External Examiner. Both internal and external examiner will assess the performance of the student in the evaluation.

Tools for Assessment CIA (50 Marks)				
Activity - I	**Activity - II**	**Activity - III**	**Activity - IV**	**Total**
10	**10**	**10**	**20**	**50**

ESE (50 Marks)		
Activity - I	**Activity - II**	**Activity - III**
20	**15**	**15**

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	H	H	L	M	M	L	M	M	H	H	M	M
CO2	M	M	M	M	H	M	M	M	H	H	H	M	H
CO3	H	L	M	H	M	M	L	H	M	H	H	M	M
CO4	M	H	L	M	L	L	H	M	H	M	H	H	M
CO5	M	M	H	H	M	H	M	H	H	H	M	H	H
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U3FRP512	Core Paper XII - Serology and Toxicology Practical		
Semester : V	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	Forensic serology goes along with toxicology. Serology is the study of the bodily fluids inside of the body such as blood, semen, saliva, perspiration and fecal matter and toxicological examination looks for the presence of drugs and/or poisons in biological tissues and fluids.		
Course Category	Employability		
Development Needs	Global		
Course Description	Course is structured to provide the basic concepts of analytical methods as it applies to hair, drug and body fluid and other toxicologic evidences.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Learn to analyze and compare and identify different types of hair.	Demonstration / Video Lessons	Practical
CO 2	Conduct test to identify blood stains, blood group and diatoms.	Demonstration	Practical
CO 3	Learn the distillation of alcoholic drinks.	Demonstration / Video Lessons	Practical
CO 4	Learn the systematic methods of collection and packing of toxicological samples.	Demonstration / Video Lessons	Practical
CO 5	To prepare a TLC plate and examination of drugs and pesticides.	Demonstration / Video Lessons	Practical

Offered by	Forensic Science

Course Content	Instructional Hours / Week : 5

S. No.	Experiment
1	Analysis and comparison of human and animal hair.
2	Blood grouping of fresh blood stains.
3	Presumptive test for blood stains.
4	Microcrystal tests for dried blood stains.
5	Microscopic analysis of diatom
6	Collection and packing of toxicological samples.
7	Extraction of drugs and poisons from different matrices.
8	Distillation of alcoholic drinks.
9	Preparation of TLC plates.
10	TLC examination of drugs and pesticides
	TOTAL 75 Hours

Tools for Assessment (50Marks)

Analytical Skill	Lab Performance	Inference	Test I	Test II	Observation	Total
8	8	8	10	10	6	50

Mapping													
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	M	-	M	L	-	H	H	L	-
CO2	H	H	H	H	M	-	M	L	-	H	H	L	-
CO3	H	H	H	H	M	-	M	L	-	H	H	L	-
CO4	H	H	H	H	M	-	M	L	-	H	H	L	-
CO5	H	H	H	H	M	-	M	L	-	H	H	L	-
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U3FRE501	Discipline Specific Elective Paper : I (A) - Introduction to Forensic Finance		
Semester : V	Credits : 4	CIA : 50 Marks	ESE : 50 Marks

Course Objective	Learn to identify analyse and provide evidence that financial fraud has taken place
Course Category	Employability
Development Needs	Global
Course Description	Financial forensics is a field that combines criminal investigation skills with financial auditing skills to identify criminal financial activity coming from within or outside of an organization.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Acquire knowledge about the concept of Forensic Finance	Lecture/Demonstration	Assignment
CO 2	To learn various Financial Analysis Techniques	Lecture/Demonstration	Seminar
CO 3	Acquire skills to detect and prevent Fraud	Lecture/ tutorial	Quiz
CO 4	Know about various investigative techniques and tools	Lecture/Video lecture	Assignment
CO 5	Learn the Professional Conduct and legal framework	Lecture/ Case studies	Case study

Offered by	**Forensic Science**

Course Content — **Instructional Hours / Week : 6**

Unit	Description	Text Book	Chapters
I	**Introduction and operation analysis** Definition of Forensic Finance, History and Evolution of Forensic Finance, Role of Forensic Finance in Investigations and Litigation Business Model and Strategy, Industry and Market Analysis, Customer Base and Revenue Streams, Operations and Supply Chain, Human Resources and Management	1	1
	Instructional Hours		**18**
Suggested Learning Methods: **Powerpoint presentation**			
II	**Financial Analysis Techniques** Financial Statement Analysis, Ratio Analysis, Cash Flow Analysis, Projections and Forecasts, Valuation Methods, key performance indicators	1	2
	Instructional Hours		**18**
Suggested Learning Methods: Library extra reading			
III	**Fraud Detection and Prevention** Types of Financial Fraud, Red Flags and Warning Signs, Fraud Detection Techniques, Fraud Prevention Strategies	1	3
	Instructional Hours		**18**
Suggested Learning Methods: Online training			

IV	**Investigative Techniques and Tools** Interviewing Techniques, Document Analysis, Digital Forensics Data Mining and Analysis, Case Management Software	1	4
		Instructional Hours	**18**
Suggested Learning Methods: Video lectures			
V	**Professional Conduct and legal framework** Code of Conduct and Professional Standards, Confidentiality and Data Protection, Conflict of Interest and Independence, Communication and Transparency. Laws and Regulations Governing Financial Crimes in India, Investigation and Litigation Process in India, Expert Witness Testimony and Reports in India	1	5
		Instructional Hours	**18**
Suggested Learning Methods: Case studies			
		Total Hours	**90**

Text Books	1. Notes Compiled by the department of Forensic Science, Nehru Arts and Science College Coimbatore
Reference Books	1. Forensic Accounting and Fraud Examination by William S. Hopwood, Jay J. Leiner, and George R. Young 2. Financial Investigation and Forensic Accounting, Third Edition by George A. Manning and Richard A. Simpson 3. Forensic Analytics: Methods and Techniques for Forensic Accounting Investigations by Mark Nigrini 4. Fraud Examination, Fifth Edition by W. Steve Albrecht, Chad O. Albrecht, Conan C. Albrecht, and Mark F. Zimbelman 5. Principles of Fraud Examination, Fourth Edition by Joseph T. Wells

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	L	L	H	-	-	-	-	H	H	L	-
CO2	H	H	M	H	L	-	M	-	-	H	H	M	-
CO3	H	H	M	H	L	-	M	-	-	H	H	M	-
CO4	H	H	H	H	L	-	-	-	-	H	H	M	-
CO5	H	M	L	L	M	-	-	-	-	M	H	M	-

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U3FRE502	Discipline Specific Elective Paper : I (B) - Introduction to Cyber Forensic Science		
Semester : V	Credits : 4	CIA : 50 Marks	ESE : 50 Marks

Course Objective	Introduce the students to cybercrimes, their types, investigation and laws related to it.
Course Category	Knowledge
Development Needs	Global
Course Description	Cyber forensic Science is an advanced area in forensic science. This course is designed to introduce the concepts to any forensic student who wish to specialize in the cyber forensic field.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Recognise terminologies related to computers and cyber security.	Lecture/Demonstration	Assignment
CO 2	Have an overall view of various cybercrimes.	Lecture/ Case studies	Case studies
CO 3	Develop a basic idea about the tools and techniques in the field of cybercrime investigation.	Lecture/Demonstration	Seminar
CO 4	Legal framework in which cybercrime investigation is done.	Lecture/Video lecture	Quiz
CO 5	Know the role and functions of various cybercrime investigation tools.	Lecture/Demonstration	Assignment

Offered by Forensic Science

Course Content **Instructional Hours / Week : 6**

Unit	Description	Text Book	Chapters
I	**Introduction and Topology** Historical development, Classification of cybercrime – Conventional crime vs. cybercrime, Causes for cybercrime, Trends in cybercrime worldwide. Hacking, cracking, DoS, Viruses, worms, malwares, bombs, email bombing, data diddling, salami attacks, phishing, steganography, cyber stalking, spoofing, pornography, defamation, computer vandalism, cyber terrorism, cyber warfare, crime in social media, social engineering, credit card frauds and financial frauds, telecom frauds, Cloud based crime, Understanding fraudulent behaviour, fraud triangle, fraud detection techniques, Intellectual Property Rights, Violation of Intellectual Property Rights, E-commerce frauds.	1	1
		Instructional Hours	**18**

Suggested Learning Methods: **PowerPoint presentation**

II	**Cyber Crimes** Introduction to Computer Crime, Characteristics of Computer Crime, Classification of computer crimes. Introduction to cyber crimes and their classification, Hacking and Cyber Laundering, Spamming, Obscenity and Pornography, Programme Manipulation, Cyber stalking and web jacking, Phishing and Spoofing, DOS and DDOS Attacks, Intellectual, Property Crimes & Computer Security. Introduction to Cyber forensic, Malware and their types, Types of viruses and worms, Super zapping and trap doors, Identity Theft Frauds, Cyber Criminals & Their Targets, Modus operandi of cyber criminal.	1	2
		Instructional Hours	**18**
Suggested Learning Methods: Library extra reading			
III	**Evidence Collection** Cardinal rules of cyber forensic, Imaging of Hard disk and other media, Password Cracking, E-Mail Investigation, Encryption and decryption methods, Restoration of Deleted File, Tools for Cyber Forensic Analysis, Digital crime scene investigation, Cyber Forensic Workstation, Legal Perspective of Digital Evidences.	1	3
		Instructional Hours	**18**
Suggested Learning Methods: Video lectures			
IV	**Cyber crime investigation** Cyber/digital forensics, Cyber forensics life cycle, Chain of custody, Search, seizure and preservation of digital evidence, Cyber forensic tools, Cloud forensics, Data privacy issues, Cryptography, Cyber forensic divisions in State and Central Governments, Cybercrime cells, Cyber appellate authorities.	1	4
		Instructional Hours	**18**
Suggested Learning Methods: Library extra reading			
V	**Cyber laws in India** Information Technology (amended) Act, 2008 – Indian Evidence Act, 1872 – Digital evidence – Cyber laws across the globe – UNCITRAL – Jurisdiction issues Unit V: Cybercrime and Counter-measures Information security – Best information security practices in India and other countries – E-mail security – Web application security, malware security, network security, cloud security and wireless security.	1	5
		Instructional Hours	**18**
Suggested Learning Methods: PowerPoint presentation			
		Total Hours	**90**

Text Books	1. Notes Compiled by the Department of Forensic Science, Nehru Arts and Science College, Coimbatore.
Reference Books	1. Colarik, A. & Janczewski, L. (2011). Cyber Warfare and Cyber Terrorism. Springer. 2. Fadia, A. (2005). The Unofficial Guide to Ethical Hacking. Course Technology. 3. Erickson, J. (2008). Hacking: The Art of Exploitation, 2nd Edition. No Starch Press.
Web. URLs	1. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/Forensic_Science/16._Digital_forensics/10._Introduction_to_cyber_crimes_and_their_classification/et/6311_et_6311_et_et.pdf 2. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/forensic_science/16._digital_forensics/26._cardinal_rules_of_cyber_forensic/et/6316_et_6316_et_et.pdf

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	H	L	L	L	H	H	-	M	M	L	L	L
CO2	L	H	H	H	H	H	H	-	H	H	L	L	L
CO3	H	H	H	H	H	H	M	-	H	H	L	L	L
CO4	H	M	L	H	M	M	H	-	H	M	L	L	L
CO5	H	L	L	M	M	M	M	-	M	M	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U3FRE503	Discipline Specific Elective Paper : I (C) - Forensic Psychology		
Semester : V	Credits : 4	CIA : 50 Marks	ESE : 50 Marks

Course Objective	To enhance understanding of behavior, in terms of its biological, cognitive, social, emotional and contextual components and their interaction, and to develop an appreciation for its implications in forensic settings.
Course Category	Knowledge
Development Needs	Global
Course Description	Forensic Psychology is the application of psychology in the aid of legal investigation. Forensic psychology looks into the vast psychological perspectives and applies them to legal investigations including issues such as public policies, new laws, competency, and also the mental state of a defendant.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To understand the basic concepts of psychology suitable for forensic science professionals	Lecture/Demonstration	Assignment
CO 2	Understand the concepts of Normality and Abnormality	Lecture/Demonstration	Case studies
CO 3	Gain knowledge about various psychological disorders	Lecture/Video lecture	Seminar
CO 4	Able to discriminate Sociopathy and Psychopathy	Lecture/ Case studies	Quiz
CO 5	To learn about Criminal profiling and various Criminal profiling methods.	Lecture/Demonstration	Assignment

Offered by	**Forensic Science**

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Forensic Psychology** Definition and sub-specializations of forensic psychology, History of Forensic Psychology, Ethical Issues in forensic psychology, Relationship between psychology and law and Relationship of forensic psychology with criminology and criminal psychology Scope and future of forensic psychology, Mac Naughten rule, Insanity in Indian penal code (IPC 84): Legal insanity and medical insanity.	1	1
		Instructional Hours	**18**

Suggested Learning Methods: **Library extra reading**

II	**Normality and Abnormality** The concept of normality and abnormality, Historical view of abnormal behaviour, Abnormal behaviour: Current status and classification systems- ICD and DSM- Merits and demerits of classification- Causes and risk factors, biological viewpoints, Psycho-social viewpoints: Major perspectives, Socio-cultural viewpoint, Alcohol abuse and dependence, Clinical picture and Causal factors, Drug abuse and dependence, Opium and its derivatives, Barbiturates, Amphetamines, Cocaine, Hallucinogens, Marijuana, Caffeine and nicotine, Factors affecting drug abuse.	1	2
		Instructional Hours	**18**
Suggested Learning Methods: Library extra reading			
III	**Psychological Disorder** Mood disorders: Mania and depression, Unipolar and bipolar disorders, Causal factors in mood disorders: Biological, Psychological, and Socio-cultural factors, Anxiety disorders, Phobic disorders, Panic disorder and agoraphobia, Generalised Anxiety Disorder and Obsessive Compulsive Disorder, Personality disorders: Clinical features of personality disorders, Types of Personality disorders, Paranoid, Schizoid, Schizo-typal, Histrionic, Narcissistic, Antisocial, Borderline, Avoidant, Dependent, Obsessive-compulsive, Passive-aggressive and Depressive personality disorder, Causal factors in personality disorders: Biological, Psychological and Socio-cultural, Schizophrenia and delusional disorder, The clinical picture in schizophrenia, Subtypes of schizophrenia-Paranoid, Catatonic, Disorganised, Residual and undifferentiated type, Causal factors in Schizophrenia, Biological, Psychological, and Socio-cultural factors, The clinical picture in delusional disorder, Causal factors in delusional disorder.	1	3
		Instructional Hours	**18**
Suggested Learning Methods: Case studies			
IV	**Psychopathy and Sociopathy** Eyewitness testimony: its importance and significance, Violence and aggression: biological factors, psychological factors and social factors, Childhood disorders and criminality, The Criminal Psychopath-general behavioural characteristics of psychopaths, difference between psychopath and sociopath, Antisocial Personality Disorder and Psychopath and Offending patterns of criminal psychopaths, Criminal Homicide, Multiple Murder, Serial Killers, Mass Murders.	1	4
		Instructional Hours	**18**
Suggested Learning Methods: Video lectures			

V	**Criminal Profiling** Inductive and Deductive approaches and criminal profiling methods. Polygraph: instrument and its parameters, scientific basis and techniques: relevant-irrelevant techniques, CQT, Card test Brain mapping, BEOS: introduction to BEOS instrument, Procedure, suspect interview, designing of probes-audio & amp;amp; visual, recording and its analysis, Narco Analysis: History and Procedure and its forensic importance.	1	5
		Instructional Hours	18
Suggested Learning Methods: Video lectures			
		Total Hours	**90**

Text Books	1. Notes compiled by the department of forensic science, Nehru Arts and Science College Coimbatore.
Reference Books	1. Alloy, L.B., Riskind, J.H., Manos, M.J. – Abnormal Psychology-Current Perspectives,9 th Edition(2005), Tata Mc graw –Hill. 2. Bartol, C.R & amp;amp; Bartol, A.M. (2008).Introduction to Forensic Psychology: 3. Research and Application.USA: SAGE publications. 4. Carson, R.C., Butcher, J.N. & Mineka, S. (2000). Abnormal Psychology and 5. Modern Life. (11th Ed). New York: Alleyn & amp;amp; Bacon.
Web. URLs	1. https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	H	M	-	M	-	-	M	H	H	-
CO2	H	M	L	H	M	-	M	-	-	M	H	H	-
CO3	H	H	L	H	M	-	M	-	-	M	H	H	-
CO4	H	M	L	M	M	-	M	-	-	M	H	H	-
CO5	H	H	L	H	H	-	-	-	M	H	H	H	-

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U4FRS503	Skill Based Paper III - Law for Forensic Science		
Semester : V	Credits : 3	CIA : 30 Marks	ESE : 45 Marks
Course Objective	This course is designed to provide awareness to the students regarding the legal framework in which Forensic Science operates.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	Being the application of science for law, Forensic Science depends heavily on the law of the land. Hence this course provides a deep insight about various laws.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the Indian Legal System	Lecture/Demonstration	Assignment
CO 2	Learn the concept of evidence in legal system.	Lectures/ Tutorials	Seminar
CO 3	Understand the role of witnesses in the criminal justice system.	Tutorial / Case Studies	Quiz
CO 4	To gain an understanding about the legal communications.	Tutorial / Case Studies	Activity
CO 5	Acquire basic idea about presumptions and burden of proof.	Lecture	Assignment

Offered by Forensic Science

Course Content **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	**Indian Legal System** Introduction to the Indian legal system: Sources of law, types of laws, courts and their jurisdictions, legal procedures, and legal maxims. Basic concepts of criminal law, criminal liability, and criminal defences. Indian Penal Code : The structure of the Indian Penal Code (IPC), the offenses and their definitions, general structure of IPC, and the procedure for filing a criminal complaint.	1	all
		Instructional Hours	**12**
Suggested Learning Methods: **Library extra reading**			
II	**Evidence in Legal System** Introduction to Evidence Law: Basic concepts of evidence, its relevance and importance in the legal system, and the distinction between admissible and inadmissible evidence. Types of Evidence : Different types of evidence, including direct evidence, circumstantial evidence, real evidence, documentary evidence, and oral evidence. Relevancy of Evidence : Rules of relevancy and admissibility, the distinction between relevant and irrelevant evidence, and the criteria for determining the relevance of evidence.	1	7,8
		Instructional Hours	**12**
Suggested Learning Methods: PowerPoint Presentation			

III	**Witness** Witnesses: The types of witnesses, including eyewitnesses, expert witnesses, and hostile witnesses, and the examination of witnesses in court. Examination of Witnesses : Different modes of examination of witnesses, including examination-in-chief, cross-examination, and re-examination, and the rules and techniques for conducting effective examination of witnesses. Hearsay Evidence and legal significance.	1	all
		Instructional Hours	**12**
Suggested Learning Methods: Case Studies			
IV	**Legal Communications** Opinion Evidence : The admissibility of opinion evidence, including expert opinion evidence, and the rules governing the admissibility of such evidence. Confessions and Admissions : The admissibility of confessions and admissions in criminal trials, the distinction between voluntary and involuntary confessions, and the rules governing the admissibility of such evidence. Privileged Communications : The concept of privileged communications, including lawyer-client privilege, doctor-patient privilege, and spousal privilege, and the rules governing the admissibility of such evidence.	1	11,12
		Instructional Hours	**12**
Suggested Learning Methods: Case Studies			
V	**Burden of proof and Presumptions** Presumptions : Different types of presumptions, including legal and evidential presumptions, and the rules governing the use of presumptions in trials. Burden of Proof in Special Cases : The burden of proof in criminal cases, civil cases, and cases involving breach of trust or fraud.	1	15
		Instructional Hours	**12**
Suggested Learning Methods: Video lecture			
		Total Hours	**60**

Text Books	1. Ratanlal, R., & Dhirajlal, K. (2016). The Law of Evidence. Lucknow, India: Eastern Book Company.
Reference Books	1. Lal, B. (2020). Law of evidence. Central Law Agency. 2. Rai, A. K. (2016). Evidence law: Principles, practice, and problems. Eastern Book Company. 3. Universal. (2020). Indian Evidence Act: Bare Act with short notes. Universal Law Publishing. 4. Gupta, S. P. (2016). Textbook on the law of evidence. Universal Law Publishing.

Tools for Assessment (30 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	7	5	5	5	30

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	M	-	-	L	H	-	H	-	H	M	L	H	-
CO2	M	L	L	H	H	-	L	-	H	M	L	H	-
CO3	H	M	H	H	H	-	L	-	H	H	H	H	-
CO4	M	L	L	M	H	-	H	-	H	H	L	H	-
CO5	M	-	H	M	H	-	L	-	H	M	-	H	-
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U3FRC613	Core Paper XIII - Questioned Document Examination		
Semester : VI	Credits : 4	CIA : 50 Marks	ESE : 50 Marks

Course Objective	To impart knowledge and skill of handling questioned documents and investigating crimes associated with documents.
Course Category	Employability
Development Needs	Global
Course Description	Documents are simply recorded information. This course is designed to provide in depth knowledge in analysis of documents for all sorts of possible fraud practices.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Have a clear idea about document examination.	Lecture/Demonstration	Assignment
CO 2	Differentiate two handwriting.	Lecture/ Case studies	Case studies
CO 3	Identify the author of a handwriting.	Lecture/Demonstration	Seminar
CO 4	Differentiate natural variation from forgery.	Lecture/Video lecture	Quiz
CO 5	Examine security documents such as currency note, passport etc.	Lecture/Demonstration	Assignment

Offered by Forensic Science

Course Content — **Instructional Hours / Week : 6**

Unit	Description	Text Book	Chapters
I	**Introduction to questioned documents** Introduction to questioned documents, History of questioned documents, Classification of questioned documents and various classes of questioned documents, Scope and application of questioned documents, Preservation and handling of questioned documents : Do's and Don'ts, Tools and techniques used for the examination of questioned documents, Ethics for Questioned Document experts. Various document examination associations.	1	all
		Instructional Hours	**18**
Suggested Learning Methods: **Video lectures**			
II	**Handwriting and Signature examination** Introduction to handwriting and signature examination, Class characteristics and individual characteristics of handwriting, Forgery and types of forgeries, Forensic examination and identification of forgeries, Examination of additions, alterations and obliteration in the documents, Examination of mechanical and chemical erasures on the documents.	1	10
		Instructional Hours	**18**
Suggested Learning Methods: Laboratory practice			

III	**Examination of documents** Examination of security documents (Currencies, passports, postal stamps, stamp papers, etc.). Examination of credit cards, e-documents, digital signatures. Examination of manipulated and fake documents.	1	12
		Instructional Hours	**18**
Suggested Learning Methods: Laboratory practice			
IV	**Age of document** Examination of Ink and Paper, Determination of age of documents, Destructive method and non-destructive methods used in examination of ink and paper, Importance of typewriters and printers in forensic document examination, Examination of charred documents and secret writings, Examination of rubber stamps and mechanical impressions, Examination of alterations, erasures, overwriting, additions, and obliteration.	1	11
		Instructional Hours	**18**
Suggested Learning Methods: Hands on training			
V	**Typewriters and Printers** Physical matching of documents: analysis of sequence of folds, staple / punch marks, etc. Determination of age of documents. History of Typewriters, types of typewriters, identification of machine, typescripts and typist. History of printers, types of printers: dot matrix, inkjet, laser, Thermal etc. Examination of printed contents and identification of the printing machine. Facsimile machines - working, examination. Importance of Typewriters, printers and facsimile machines in Forensic document examination.	1	15
		Instructional Hours	**18**
Suggested Learning Methods: Library extra reading			
		Total Hours	**90**

Text Books	1. Ramachandran, Questioned Documents, Lawmann's 2020
Reference Books	1. Ordway Hilton, Elsevier; Scientific Examination of Questioned Documents, Rev. ED: New York, (1928). 2. Albert S. Osborn, Second ; Questioned Documents, Ed. Universal Law, Publishing, Delhi, (1928). 3. Albert S. Osborn; The problem of Proof, Second Ed. Universal Law, Publishing, Delhi (1998). 4. Charles C. Thomas, Billy Prior Bates; Typewriting Identification I.S.Q.D., Springfield, Illinois (1971).
Web. URLs	1. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000016FS/P000695/M006281/ET/1516191959FSC_P8_M1_e-text.pdf 2. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000016FS/P000695/M011511/ET/1516250867FSC_P8_M32_e-text.pdf

Tools for Assessment (50 Marks)						
CIA I	**CIA II**	**CIA III**	**Assignment**	**Seminar**	**Quiz**	**Total**
8	**8**	**10**	**8**	**8**	**8**	**50**

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	M	H	L	M	-	-	H	H	-	H
CO2	M	H	M	H	M	L	H	-	-	H	H	-	H
CO3	H	H	M	H	M	L	H	-	-	H	H	-	M
CO4	M	H	M	H	M	L	H	-	-	H	H	-	M
CO5	H	H	M	H	M	L	H	L	-	H	H	-	H

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U3FRP614	Core Paper XIV- Questioned Document Examination Practical		
Semester : VI	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	Learn to provide evidence about suspicious or questioned documents using a variety of scientific principles and methods.		
Course Category	Employability		
Development Needs	Global		
Course Description	In forensic science, questioned document may be examined to determine its origin, authenticity, and many other facets in order to solve a potential crime.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the variation in handwriting and altered documents	Demonstration / Video Lessons	Practical
CO 2	To examine security documents	Demonstration	Practical
CO 3	Deciphering Secret writings	Demonstration / Video Lessons	Practical
CO 4	Analysis of ink	Demonstration / Video Lessons	Practical
CO 5	Learn to write report in forgery case	Demonstration / Video Lessons	Practical

Offered by	Forensic Science

Course Content	Instructional Hours / Week : 6

S. No.	Experiment
1	Examination of handwriting and comparison.
2	Examination and comparison of signature.
3	Security documents examination: currency note and passport examination.
4	Deciphering the secret writing and miniature writing.
5	Paper chromatography for ink analysis.
6	Analysis of sequence of stroke in altered documents (addition).
7	Identification of author from disguised writing.
8	Moot court and case laws
9	Report writing- in a simulated case of handwriting or signature forgery
10	Preservation of charred documents
	TOTAL 90 Hours

Tools for Assessment (50 Marks)

Analytical Skill	Lab Performance	Inference	Test I	Test II	Observation	Total
8	8	8	10	10	6	50

Mapping													
CO\ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	H	H	H	-	-	L	-	-	H	H	-	M
CO2	H	H	M	H	-	-	M	-	-	H	H	-	M
CO3	H	H	M	H	-	-	M	-	-	H	H	-	M
CO4	H	H	M	H	-	-	M	-	-	H	H	-	M
CO5	H	H	M	H	-	-	M	-	-	H	H	-	M
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U3FRT604	Discipline Specific Elective Paper : II (A) – Internship ; Analytical Science		
Semester : VI	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	The objective of this course is to provide undergraduate students with hands-on experience in the working of various organisations in the field of criminal justice administration.		
Course Category	Skill Development		
Development Needs	Employability		
Course Description	This course provides undergraduate students with an opportunity to work with various agencies involved in the criminal justice system and get real time experience. This will develop skills in critical thinking, laboratory skills, and effective communication.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To understand the functions of various organisations involved in criminal justice administration.	Hands-on training	Review
CO 2	Analyse the administration and activities of the different agencies in the field of forensic science.	Hands-on training	Review
CO 3	Understand the scope of Forensic Science in various fields.	Hands-on training	Review
CO 4	Know the skillset require for a forensic scientist to work in the industry.	Hands-on training	Review
CO 5	Create knowledge and give it to the society.	Hands-on training	Review
Offered by	Forensic Science		

List of activities student must indulge in **Instructional Hours / Week : 6**

The students must undergo a 15-day internship in various labs/police station/ advocate office/court/ prison/ related industries to expose to the various agencies and their functioning

Details of the evaluation procedure:

(i) Student must complete all 15 days of internship work and produce certificate issued by the respective agency for proof.

(ii) A report comprise of the daily activities done by the student should be submitted within the stipulated time.

(iii) During the end semester examination, the evaluation will be done by a panel of examiners, including internal examiners.

(iv) A public viva voce, where the I, & II Year students will be the audience

Tools for Assessment CIA (50 Marks)				
Review - I	**Review - II**	**Review - III**	**Document Preparation & Implementation**	**Total**
10	**10**	**10**	**20**	**50**

ESE (50 Marks)		
Report	**Presentation**	**Viva voce**
20	**15**	**15**

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	M	M	L	H	M	M	M	H	H	H	H	M
CO2	H	H	M	M	H	M	M	M	H	H	H	M	H
CO3	H	H	M	H	H	M	M	M	M	H	H	M	M
CO4	H	H	H	M	H	L	H	H	H	M	H	H	M
CO5	H	H	M	H	M	H	M	M	H	H	M	H	H
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U3FRT605	Discipline Specific Elective Paper : II (B) – Internship ; Legal Services		
Semester : VI	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	The objective of this course is to provide undergraduate students with hands-on experience in the working of various organisations in the field of criminal justice administration.		
Course Category	Skill Development		
Development Needs	Employability		
Course Description	This course provides undergraduate students with an opportunity to work with various agencies involved in the criminal justice system and get real time experience. This will develop skills in critical thinking, laboratory skills, and effective communication.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To understand the functions of various organisations involved in criminal justice administration.	Hands-on training	Review
CO 2	Analyse the administration and activities of the different agencies in the field of forensic science.	Hands-on training	Review
CO 3	Understand the scope of Forensic Science in various fields.	Hands-on training	Review
CO 4	Know the skillset require for a forensic scientist to work in the industry.	Hands-on training	Review
CO 5	Create knowledge and give it to the society.	Hands-on training	Review
Offered by	Forensic Science		

List of activities student must indulge in **Instructional Hours / Week : 6**

The students must undergo a 1- day internship in various labs/police station/ advocate office/court/ prison/ related industries to expose to the various agencies and their functioning.

Details of the evaluation procedure:

(i) Student must complete all 15 days of internship work and produce certificate issued by the respective agency for proof.

(ii) A report comprise of the daily activities done by the student should be submitted within the stipulated time.

(iii) During the end semester examination, the evaluation will be done by a panel of examiners, including internal examiners.

(iv) A public viva voce, where the I, & II Year students will be the audience

Tools for Assessment CIA (50 Marks)				
Review - I	**Review - II**	**Review - III**	**Document Preparation & Implementation**	**Total**
10	**10**	**10**	**20**	**50**

ESE (50 Marks)		
Report	**Presentation**	**Viva voce**
20	**15**	**15**

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	M	M	L	H	M	M	M	H	H	H	H	M
CO2	H	H	M	M	H	M	M	M	H	H	H	M	H
CO3	H	H	M	H	H	M	M	M	M	H	H	M	M
CO4	H	H	H	M	H	L	H	H	H	M	H	H	M
CO5	H	H	M	H	M	H	M	M	H	H	M	H	H
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U3FRT606	Discipline Specific Elective Paper : II (C) – Internship ; Police and Correctional Administration		
Semester : VI	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	The objective of this course is to provide undergraduate students with hands-on experience in the working of various organisations in the field of criminal justice administration.		
Course Category	Skill Development		
Development Needs	Employability		
Course Description	This course provides undergraduate students with an opportunity to work with various agencies involved in the criminal justice system and get real time experience. This will develop skills in critical thinking, laboratory skills, and effective communication.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To understand the functions of various organisations involved in criminal justice administration.	Hands-on training	Review
CO 2	Analyse the administration and activities of the different agencies in the field of forensic science.	Hands-on training	Review
CO 3	Understand the scope of Forensic Science in various fields.	Hands-on training	Review
CO 4	Know the skillset require for a forensic scientist to work in the industry.	Hands-on training	Review
CO 5	Create knowledge and give it to the society.	Hands-on training	Review
Offered by	Forensic Science		

List of activities student must indulge in **Instructional Hours / Week : 6**

The students must undergo a 15-day internship in various labs/police station/ advocate office/court/ prison/ related industries to expose to the various agencies and their functioning.

Details of the evaluation procedure:

(i) Student must complete all 15 days of internship work and produce certificate issued by the respective agency for proof.

(ii) A report comprise of the daily activities done by the student should be submitted within the stipulated time.

(iii) During the end semester examination, the evaluation will be done by a panel of examiners, including internal examiners.

(iv) A public viva voce, where the I, & II Year students will be the audience

Tools for Assessment CIA (50 Marks)				
Review - I	**Review - II**	**Review - III**	**Document Preparation & Implementation**	**Total**
10	**10**	**10**	**20**	**50**

ESE (50 Marks)		
Report	**Presentation**	**Viva voce**
20	**15**	**15**

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	M	M	L	H	M	M	M	H	H	H	H	M
CO2	H	H	M	M	H	M	M	M	H	H	H	M	H
CO3	H	H	M	H	H	M	M	M	M	H	H	M	M
CO4	H	H	H	M	H	L	H	H	H	M	H	H	M
CO5	H	H	M	H	M	H	M	M	H	H	M	H	H
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U3FRV607	Discipline Specific Elective Paper : III (A) - Project and Viva voce		
Semester : VI	Credits : 4	CIA : 50 Marks	ESE : 50 Marks
Course Objective	The objective of this course is to provide undergraduate students with hands-on experience in conducting research projects, with a focus on developing skills in problem-solving, critical analysis, data collection, and effective communication.		
Course Category	Skill Development		
Development Needs	Employability		
Course Description	This course provides undergraduate students with an opportunity to design, plan, and execute a research project in their field of study, developing skills in critical thinking, data analysis, and effective communication.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Explain the basic concepts of research in Forensic Science	Classroom	Review
CO 2	Write extensively about a particular topic.	Practical Training	Review
CO 3	Analyse literature, collect data and interpret it	Reading review articles	Review
CO 4	Choose a problem and conduct a scientific enquiry on it.	Laboratory/ Survey	Review
CO 5	Create knowledge and give it to the society.	Research paper writing	Review
Offered by	Forensic Science		

List of activities student must indulge in **Instructional Hours / Week : 6**

The students, under the guidance of a teacher shall take up a project on any relevant topic related to Forensic Science.

Details of the evaluation procedure:

(i) Each student will work on a topic/area of interest and conduct a micro level quantitative or qualitative study as their project work

(ii) The student has to submit a project report and should appear for a public viva voce before a panel of internal and external examiners

(iii) The project report will be evaluated at two levels- continuous assessment and end semester examination.

(iv) A public viva voce.

Project Guidelines

ARRANGEMENT OF CONTENTS:

The sequence in which the project report material should be arranged and bound is as follows:

1. Cover Page & Title Page
2. Table of Contents
3. List of Tables
4. List of Figures
5. List of Symbols, Abbreviations
6. Chapters
7. References
8. Appendices The table and figures shall be introduced in the appropriate places

Tools for Assessment CIA (50 Marks)				
Review - I	**Review - II**	**Review - III**	**Document Preparation & Implementation**	**Total**
10	**10**	**10**	**20**	**50**

ESE (50 Marks)		
Report	**Presentation**	**Viva voce**
20	**15**	**15**

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	M	-	L	M	H	L	M	M	L	H	M	L
CO2	H	L	L	M	L	H	M	M	L	H	H	M	L
CO3	H	M	-	H	M	H	H	L	M	H	H	M	L
CO4	H	H	H	M	H	H	H	M	L	M	H	M	L
CO5	M	M	M	H	L	H	M	L	L	H	M	M	L
H-High; M-Medium; L-Low													

Course designed by	Verified by

Course Code	Title		
22U3FRE608	Discipline Specific Elective Paper : III (B) - Criminal Procedure and Evidence		
Semester : VI	Credits : 4	CIA : 50 Marks	ESE : 50 Marks

Course Objective	To understand the significant legal aids to access justice system. To study the conceptual module of studies related to evidence. To know the administration setup and functions of examination of witnesses and interrogation of accused.
Course Category	Knowledge
Development Needs	National
Course Description	Course provides a comprehensive introduction and in-depth analysis of the rules of evidence and criminal procedural law

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Comprehensive understanding of evidence based issues.	Lecture/Demonstration	Assignment
CO 2	Recognize the problem-solving contexts.	Lecture/ Case studies	Case studies
CO 3	Examine the crime scene information.	Lecture/Demonstration	Seminar
CO 4	Discover the significant legal aids to access justice system.	Lecture/Video lecture	Quiz
CO 5	Interpret the administration setup and functions of examination of witnesses and interrogation of accused.	Lecture/Demonstration	Assignment

Offered by Forensic Science

Course Content **Instructional Hours / Week : 6**

Unit	Description	Text Book	Chapters
I	**Criminal courts** Historical development of judicial system in India, Structural organisation and functions of courts, Powers and Jurisdiction of courts. Criminal courts. Special courts, Nyaya Panchayat & Lok Adalats.	1	all
		Instructional Hours	**18**
Suggested Learning Methods: **Library extra reading**			
II	**Criminal Procedure** Arrest of persons, Investigation, Search and Seizure. Summons to produce, Warrant of arrest, Search warrants. Inquiry, Bail proceedings, Remand, Summons and Warrant. Case / trials, Types of criminal trials, Plea bargaining, Role of prosecution, Appeal. Judgement – Reference and Revision.	1	all
		Instructional Hours	**18**
Suggested Learning Methods: Case studies			

III	**Evidence in criminal cases** Accusatorial system vs. inquisitorial system. Significance of evidence. Types of evidences : Fact in issue, Evidence - Admissibility and relevancy, Confession, Dying declaration. Expert opinion, Conspiracy evidence , Approver evidence.	1	all
		Instructional Hours	**18**
Suggested Learning Methods: Case studies			
IV	**Judicial Presumption, Witness and Examination** Presumption of law: Presumption of fact, Burden of proof Witness: Examination, Cross examination, Impeaching the credit of witness	1	all
		Instructional Hours	**18**
Suggested Learning Methods: Library extra reading			
V	**Judgements** Execution of sentence, Suspension of sentence, Remission, Commutation of sentence. Death sentence, Imprisonment, Bonds, Fine, Probation, Parole, Conditional release, Admonition, Community service.	1	all
		Instructional Hours	**18**
Suggested Learning Methods: Case studies			
		Total Hours	**90**

Text Books	1. Criminal Procedure Code (CrPC) Published by GoI
Reference Books	1. Sarathy Veppa, P. (1994). Elements of law of evidence. Lucknow: Eastern Book Co. 2. Singh, A. (1995). Law of evidence. Allahabad: Allahabad Law Agency.

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	-	M	H	-	M	-	H	-	H	H	-
CO2	M	M	-	M	H	-	M	-	H	-	H	H	-
CO3	M	M	-	M	H	-	M	-	H	-	H	H	-
CO4	M	M	-	M	H	-	M	-	H	-	H	H	-
CO5	M	M	-	M	H	-	M	-	H	-	H	H	-

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
22U3FRE609	Discipline Specific Elective Paper : III (C) - Forensic Medicine and Anthropology		
Semester : VI	Credits : 4	CIA : 50 Marks	ESE : 50 Marks

Course Objective	To impart knowledge and skill of reading and understanding medico-legal reports and draw conclusions based on it.
Course Category	Employability
Development Needs	Global
Course Description	Medico legal reports such as postmortem report often help to narrow down the investigation. This course is designed to provide an in-depth knowledge about the various causes of death and methodologies to identify them.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To understand medico legal aspects of death	Lecture/Demonstration	Assignment
CO 2	Identify the time since death from post-mortem report.	Lecture/ Case studies	Case studies
CO 3	Understand various causes of death.	Lecture/Demonstration	Seminar
CO 4	Identify various injuries and punishments associated with it.	Lecture/Video lecture	Quiz
CO 5	Read and understand reports on crimes against body.	Lecture/Demonstration	Assignment

Offered by Forensic Science

Course Content — **Instructional Hours / Week : 6**

Unit	Description	Text Book	Chapters
I	**Introduction to Forensic Medicine and Death** Forensic Medicine: Introduction, History, Scope, Legal Procedure: Inquest, Summons. Death: Definition, types, brain death, Suspended animation, Modes of death: coma, syncope and asphyxia, determination of time since death, Identification: methods to identify living person for gender, race, age.	1	3
		Instructional Hours	**18**
Suggested Learning Methods: **Library extra reading**			
II	**Injury and Post Mortem Examination** Autopsy: introduction, legal requirements to conduct autopsy, preparation of autopsy report, Examination of dead body: types and methods, Examination of bones, Exhumation, Signs of death: Immediate, Early and Late. Rigor mortis, algor mortis, post mortem hypostasis, muscle changes, putrefaction, saponification and mummification. Injury: definition, classification, ante mortem and post mortem injuries, estimation of age of different types, Mechanical injuries: definition, classification, Causes of death by injuries, Medico legal aspects of injuries, vehicular injuries, Medico legal aspects in cases of burns and scalds- Identification of injuries by torture	1	16
		Instructional Hours	**18**
Suggested Learning Methods: Online training			

III	**Offences against body** Sexual offenses: Introduction, types, examination of accused and victim, Thermal deaths: types, post mortem appearances. Flash burns, scalds establishment of identity, Electrical injuries: factors influencing, effects, properties, Post mortem appearances, Lightning stroke: types of burns, Post mortem appearances, radioactive substances, action on an individual.	1	17
		Instructional Hours	**18**
Suggested Learning Methods: Video lectures			
IV	**Forensic Anthropology** Introduction, definition, history, scope and importance, Human skeletal system: Structure and functions, Classification of bones, Characteristics of bones. Anatomy of bones: general aspects for human and non human skeletal systems, Forensic importance of bones: estimation of age, identification of gender.	1	21
		Instructional Hours	**18**
Suggested Learning Methods: Laboratory practice			
V	**Ossification and Its Importance** Ossification: Introduction, definition, Important Ossification points in human skeletal system: For estimation of age and gender- Rate of ossification: estimation and comparison with non-human ossification points for gender identification, Anatomy of different bones, the skull, clavicle, scapula and ribs, vertebral column, Humerus radius ulna, carpals, metacarpals and phalanges, pelvis, Femur tibia, fibula, patella, tarsals, metatarsals	1	9,10
		Instructional Hours	**18**
Suggested Learning Methods: Hands on training			
		Total Hours	**90**

Text Books	1. Narayana Reddy K.S, Introduction to Forensic Medicine and Toxicology, 13th edition.
Reference Books	1. Text book of Forensic Medicine and Toxocology: V V Pillay, 15th edition, Paras Medical Publishing, Hyderabad. 2. Fundamentals of Forensic Medicine and Toxicology: R. Basu, Publishers- Books and Allie (P) LTD, Kolkata. 3. Guharaj Forensic Medicine: P V Guharaj, Edited by M R Chandran, Orient Longman, 2nd Edition, Hyderabad. 4. Nicholas V. Piscataqua: Forensic Anthropology: Current Methods and Practice.
Web. URLs	1. https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg== 2. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000016FS/P000701/M015724/ET/1464331542FSC_P14_M9_e-text.pdf 3. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000016FS/P001353/M026913/ET/1516254684FSC_P11_M35_e-text.pdf

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
8	8	10	8	8	8	50

Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	M	M	H	M	-	M	-	-	M	H	L	-
CO2	M	H	H	H	M	-	H	-	-	H	H	L	-
CO3	H	H	M	H	M	-	H	-	-	H	H	L	-
CO4	M	M	L	H	H	-	H	-	-	H	H	H	-
CO5	M	M	L	H	H	M	H	-	-	M	H	H	-
H-High; M-Medium; L-Low													

Course designed by	**Verified by**

Course Code	Title		
22U4FRS604	Skill Based Paper IV – Audio Video and Speaker Identification		
Semester : VI	Credits : 3	CIA : 30 Marks	ESE : 45 Marks

Course Objective	To learn the acquisition, analysis, and evaluation of audio & video recordings and speaker identification by comparing voices that may ultimately be presented as admissible evidence in a court of law
Course Category	Skill development
Development Needs	Global
Course Description	Audio-Video forensics involves the scientific interpretation of audio & video recordings which are obtained from a civil investigation or criminal legal proceedings. speaker dentification usually consists of the both aural and spectrographic analysis of voice and identifying a person solely by their speech.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Extract an audio or video clip from the source.	Lecture/Demonstration	Assignment
CO 2	Enhance the audio and video signals for examination	Lecture/ Case studies	Case studies
CO 3	Check the authenticity of an audio or video file	Lecture/Demonstration	Seminar
CO 4	Identification of the voice (speaker).	Lecture/Video lecture	Quiz
CO 5	Have a strong foundation on visual examination of audio spectra.	Lecture/Demonstration	Assignment

Offered by **Forensic Science**

Course Content **Instructional Hours / Week : 6**

Unit	Description	Text Book	Chapters
I	**Basic Circuits** Basic Electric Circuits - LR, CR, LCR circuits, Conventional Filters and Digital Filters (high pass filters, low pass filters). Noise Characteristics : Properties of Noise, Acoustic Characteristics of Environments-Diffraction, Reverberation and Diffusion. Recording Formats - Analog and Digital, Audio and Video file formats. Linear and Non –linear Editing.	1	1
		Instructional Hours	**18**
Suggested Learning Methods: **Library extra reading**			
II	**Introduction to video technology** Concept of Video film production - Introduction to video technology component of Digital Image Processing. Concept of Digital Water Marking. Visual examination technique on video frame image - Facial Image Recognition from video frame image.	1	2
		Instructional Hours	**18**
Suggested Learning Methods: Power point presentation			

III	**Forensic audio and video analysis** Introduction to Forensic Audio & Video Analysis: A basic understanding of forensic audio and video technology - Audio and Video Evidence handling procedures. Authentication of recorded audio and video. Scientific methodology of forensic audio-video analysis. Recovery of digital audio-video / Deleted Video & Audio Files recovery - Exporting evidence as video or still image files- Software used for audio and video analysis. Admissibility of audio and video evidence in court.	1	3
		Instructional Hours	**18**
Suggested Learning Methods: Online training			
IV	**Basics of speaker identification** Introduction: Forensic Speaker Identification, Forensic Phonetics- Forensic challenges in Voice recognition. Forensic Phonetic Parameters : Acoustic vs. Auditory Parameters, Linguistic vs. Non-Linguistic Parameters. Forensic Significance : Linguistic Analysis- Requirements on forensic-phonetic parameters. The human vocal tract and the production and description of speech parameters : Vocal tract structures. Forensic Significance – Vocal cord activity, Nasals and Nasalization. Phonetic Aspects of Speech : Articulators – Active/Passive, Phonemes –Segmental and Supra segmental, Prosodic features- Stress, Intonation, Duration, Syllables, Nasalization, Accent features.	1	4
		Instructional Hours	**18**
Suggested Learning Methods: Video lectures			
V	**Forensic speaker identification** Characterizing Forensic Speaker Identification: Speaker Recognition – Speaker Identification and Verification, Forensic Significance. Components of Speaker Recognition. Approaches to Speaker Recognition System of Auditory Analysis, Spectrographic approach or Voice Print Identification. Automatic Approach: Gaussian Mixture Models, Long Term Averaging, Vector Quantization, Hidden Markov Models, Neural Networks. Expressing Results in Forensic Speaker Recognition– Likelihood Ratio, Objective/Subjective Methods. Concept of Test and Error in Speaker Identification. Admissibility of Voice evidence in Court.	1	5
		Instructional Hours	**18**
Suggested Learning Methods: Power point presentation			
		Total Hours	**90**

Text Books	1. Notes compiled by the department of Forensic Science, Nehru Arts and Science College, Coimbatore.
Reference Books	1. Philip Rose; Forensic Speaker Identification, Taylor and Francis, Forensic Science Series, London (2002) 2. Bengold & Nelson Moryson; Speech and Audio signal processing, John Wiley & Sons, USA (1999) 3. Oscar Tosi; Voice Identification-Theory of Legal Applications, University Park Press, Baltimore (1979)

Tools for Assessment (30 Marks)						
CIA I	**CIA II**	**CIA III**	**Assignment**	**Seminar**	**Quiz**	**Total**
4	**4**	**7**	**5**	**5**	**5**	**30**

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	M	L	L	-	-	H	H	M	-
CO2	H	H	H	H	M	L	M	-	-	H	H	M	-
CO3	H	H	H	H	M	L	M	-	-	H	H	M	-
CO4	H	H	H	H	M	L	M	-	-	H	H	M	-
CO5	H	L	L	H	M	L	L	-	-	H	H	M	-

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title	
22UFRSS01	Self Study Paper I - Serious Fraud Investigation	
Semester : II - V	Credits : 1	ESE : 50 Marks
Course Objective	To provide general awareness about various types of frauds prevail in India.	
Course Category	Knowledge	
Development Needs	National	
Course Description	Course will hone the understanding of the causes of fraud and their significance in effectively fighting this white-collar crimes and to explore a range of methods for preventing, detecting, investigating and resolving fraud committed against organisations and individuals.	

Course Outcomes	
CO 1	Able to understand the conceptual perspectives of White-collar crimes
CO 2	Become aware of different types of fraud crimes
CO 3	Understand the concepts of Corruption in Politics and Government
CO 4	Understand the Professional Deviances
CO 5	Acquire knowledge of public sector frauds and response of Indian Legal Order.

Offered by	Forensic Science

Course Content

Unit	Description
I	**Conceptual Perspective of White-Collar Crimes** Conceptual Perspective of White-Collar Crimes, Understanding White-Collar Crime: Concept, meaning, Definitions, Extent, and Consequences. Indian Approaches to Socio-economics Offences, Privileged class deviance, Growth of White-Collar Crimes, Need for Specific Measures.
II	**Types of Fraud crimes** Crimes in Sales, Related Occupations, Crimes by the Corporate System, Environmental Crime, Crimes in the Health Care System, Crime in the Economic and Technological Systems, Crimes in the Housing System.
III	**Corruption in Politics and Government** Some Major Scandals: Bofors Scandal, Stock Market Manipulation Scam 1999-2001, 2G Spectrum Allocation Scandal, Commonwealth Games Scandal, Satyam Computer Scam, Fodder Scam, JBT Scam and Latest Coal Scam.
IV	**Professional Deviance** Unethical practices of the Indian Bar, Unprofessional and Unethical Journalism, Medical Malpractice, Organizational or Corporate Crime.
V	**Public sector frauds and Response of Indian Legal Order** Law Commission recommendations- White Paper on white collar crime, Vigilance Commission, Public Account Committee, Ombudsman Lokpal Bill.

Text Books	1. Upendra Baxi, The Crisis of the Indian Legal System (1982) Vikas Publishing House, New Delhi.

Reference Books	1. Upendra Baxi (ed.), Law and Poverty: Essays (1988) 2. Upendra Baxi, Liberty and Corruption: The Antulay Case and Beyond (1989) 3. Surendranath Dwevedi and G.S. Bbargava, Political Corruption in India (1967)

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	-	-	H	L	L	-	H	-	M	H	-
CO2	M	L	-	-	H	L	L	-	H	-	M	H	-
CO3	M	L	-	-	H	L	L	-	H	-	M	H	-
CO4	M	L	-	-	H	L	L	-	H	-	M	H	-
CO5	M	L	-	-	H	L	L	-	H	-	M	H	-

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title	
22UFRSS02	Self Study Paper II - Corporate Law	
Semester : II - V	Credits : 1	ESE : 50 Marks
Course Objective	To provide general awareness about corporate law in India	
Course Category	Knowledge	
Development Needs	National	
Course Description	Emerging Indian market faces a lot of crime related challenges in its corporate field. An awareness about the corporate law enable the learner to pursue a career in corporate legal sector and forensic finance.	

Course Outcomes	
CO 1	Learn the concept of Corporate law
CO 2	Understanding of corporate governance and finance
CO 3	Able to understand Corporate Restructuring, Insolvency and Securities Law
CO 4	To become aware about Competition Law and Intellectual Property Law
CO 5	To understand Corporate Dispute Resolution, Taxation, and International Corporate Law
Offered by	Forensic Science

Course Content

Unit	Description
I	**Introduction to Corporate Law** Definition and nature of a corporation, corporate personality and limited liability, Types of companies in India, Incorporation and registration process
II	**Corporate Governance and Finance** Board of Directors, Shareholders and their rights, Role of auditors and other professionals, Corporate Social Responsibility (CSR), Shares and debentures, Capital and debt financing
III	**Corporate Restructuring, Insolvency and Securities Law** Restructuring and reorganization of companies, Insolvency and bankruptcy proceedings, Liquidation and winding up, Securities and Exchange Board of India (SEBI), Regulation of securities markets, Insider trading and market manipulation
IV	**Competition Law and Intellectual Property Law** Competition Act, 2002, Competition Commission of India (CCI). Anti-competitive agreements and abuse of dominant position, Patents, trademarks, and copyrights, Protection of intellectual property rights, Technology transfer and licensing agreements
V	**Corporate Dispute Resolution, Taxation, and International Corporate Law** Alternative dispute resolution methods, Arbitration and conciliation, Litigation and court procedures, corporate tax laws and regulations, Tax planning and compliance. Tax implications of corporate restructuring and M&A transactions, international trade and investment laws. Foreign investment regulations in India, Cross-border mergers and acquisitions

Text Books	
	1. Upendra Baxi, The Crisis of the Indian Legal System (1982) Vikas Publishing House, New Delhi.

Reference Books	1. Upendra Baxi (ed.), Law and Poverty: Essays (1988) 2. Upendra Baxi, Liberty and Corruption: The Antulay Case and Beyond (1989) 3. Surendranath Dwevedi and G.S. Bbargava, Political Corruption in India (1967)

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	-	H	H	L	M	-	H	-	H	H	-
CO2	M	M	-	H	H	L	L	-	H	-	H	H	-
CO3	M	M	-	H	H	L	M	-	H	-	H	H	-
CO4	M	M	-	H	H	L	M	-	H	-	H	H	-
CO5	M	M	-	H	H	L	M	-	H	-	H	H	-

H-High; M-Medium; L-Low

Course designed by	Verified by