



INTEGRAL UNIVERSITY, LUCKNOW

INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES& RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

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

SYLLABUS

YEAR/ SEMESTER: II/III



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

Program: M.Sc. FS

Semester-III

Program: BSc: FS							Semester: III						
S N	Course code	Course Title	Type of Paper	Period Per hr/week/sem.			Evaluation Scheme				Sub. Total	Credit	Total Credits
				L	T	P	CT	TA	Total	ESE			
THEORIES													
1.	FS501	Forensic Physics	Core	2	1	0	40	20	60	40	100	2:1:0	3
2.	FS502	Forensic Biology & Serology	Core	3	1	0	40	20	60	40	100	3:1:0	4
3.	FS503	Forensic Anthropology & Odontology	Core	2	1	0	40	20	60	40	100	2:1:0	3
4.	FS504	Forensic Psychiatry and Criminal Behavior	Core	3	1	0	40	20	60	40	100	3:1:0	4
5.	FS505	Research Methodology & Biostatics	Core	3	1	0	40	20	60	40	100	3:1:0	4
6.	FS506	Ballistics	Core	3	1	0	40	20	60	40	100	3:1:0	4
PRACTICALS													
1.	FS507	Forensic Physics-Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
2.	FS508	Forensic Biology & Serology- Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3.	FS509	Forensic Anthropology & Odontology-Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
4.	FS510	Ballistics- Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
5.	FS511	Synopsis-Project Work/Dissertation/ Thesis	Core	0	5	0	50	50	100	00	100	0:0:5	5
Total				16	11	8	450	250	700	400	1100	31	31

S. N.	Course code	Course Title	Type of Paper	Attributes							United Nation Sustainable Development Goal (SDGs)
				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
THEORIES											
1.	FS501	Forensic Physics	Core	√	√	√			√	√	3,4
2.	FS502	Forensic Biology & Serology	Core	√	√	√			√	√	3,4
3.	FS503	Forensic Anthropology & Odontology	Core	√	√	√			√	√	3,4
4.	FS504	Forensic Psychiatry and Criminal Behavior	Core	√	√	√			√	√	3,4
5.	FS505	Research Methodology & Biostatics	Core	√	√	√			√	√	3,4
6.	FS506	Ballistics	Core	√	√	√			√	√	3,4
PRACTICALS											
1.	FS507	Forensic Physics-Lab	Core	√	√	√			√	√	3,4
2.	FS508	Forensic Biology & Serology- Lab	Core	√	√	√			√	√	3,4
3.	FS509	Forensic Anthropology & Odontology-Lab	Core	√	√	√			√	√	3,4
4.	FS510	Ballistics- Lab	Core	√	√	√			√	√	3,4
5.	FS511	Synopsis-Project Work/Dissertation/ Thesis	Core	√	√	√			√	√	3,4

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



Integral University, Lucknow

Effective from session: 2023-24

Course Code	FS501	Title of the Course	FORENSIC PHYSICS	L	T	P	C
Year	II	Semester	III	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Main objective of the subject is to develop the deep understanding about the different types of physical evidences and their examination.						

Course Outcomes

CO1	After completion of the unit, students will be able to understand Glass & Its Forensic Examination
CO2	After completion of the unit, students will be able to understand the soil and its importance in forensic investigation.
CO3	After completion of the unit, students will be able to understand the paint and its importance in forensic investigation.
CO4	After completion of the unit, students will be able to understand the examination of cement.
CO5	After completion of the unit, students will be able to understand the tool marks and its importance in forensic investigation.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Glass Evidence & Its Forensic Examination	Glass & Its Forensic Examination: - Types of glass and their composition, forensic examination of glass fractures under different conditions, determination of direction of impact cone fracture, rib marks hackle marks, backward fragmentation, color and fluorescence, physical matching, density comparison, physical measurements, refractive index by refract meter, elemental analysis, interpretation of glass evidence.	6	CO1
2	Soil Evidence & Its Forensic Examination	Soil: Formation and types of soil, composition and color of soil, particle size distribution, turbidity test, microscopic examination density gradient analysis, ignition test, differential thermal analysis, elemental analysis, interpretation of solid evidence, discussion on important case studies of glass & soil.	6	CO2
3	Paint Evidence & Its Forensic Examination	Paint: - Introduction, types, and their composition, macroscopic & microscopic studies, pigment distribution micro-chemical analysis solubility test, pyrolysis chromatographic techniques, TLC, Colorimetry, IR spectroscopy & X-ray diffraction elemental analysis, interpretation of paint evidence. Forensic importance of paint evidence.	6	CO3
4	Building material Evidence & Its Forensic Examination	Building material: - Types of cement and their composition, determination of adulterants by physical, chemical and instrumental methods, examination of brick, analysis of Bitumen & road materials, analysis of cement mortar and cement concrete & stones, forensic examination of electrical appliances installations.	6	CO4
5	Tool marks Evidence & Its Forensic Examination	Tool marks: - Types of tool marks: compression marks, striated marks, a combination of compression and striated marks, repeated marks, class characteristics and individual characteristics, tracing and lifting of marks, photographic examination of tool marks and cut marks on clothes and walls etc. Restoration of erased / obliterated marks: - method of making cast, punch, engrave, methods of obliteration, method of restoration etching (etching for different metals), magnetic, electrolytic etc., recording of restored marks restoration of marks on wood, leather, polymer etc.	6	CO5

Reference Books:

1. B. Caddy, Forensic Examination of glass and paints analysis and interpretation, ISBN 078405749 2001
2. C.E. O'Hara and J.W. Osterburg, An Introduction to Criminalistic, Indiana University Press, Blomington, 1972
3. Denis Shaw, Physics in the Prevention and Detection of Crime, Contem Phys. Vol.17, 1976
4. Carper, K. (ed.), Forensic Engineering, 2ndEdn. CRC Press, BocaRida, Florida, 2001
5. James, S.H. and Nordby, J.J. Eds., Forensic Science An Introduction to Scientific and Investigative Techniques, CRC Press, London, 2003

e-Learning Source:

<https://youtu.be/yHkhju99CZM>
https://youtu.be/LpndOfsq_6M

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

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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
FS501	FORENSIC PHYSICS	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from session:2023-24							
Course Code	FS502	Title of the Course	FORENSIC BIOLOGY & SEROLOGY	L	T	P	C
Year	II	Semester	III	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Main objective of the subject is to develop the deep understanding about the biological evidences encountered at various crime scenes.						

Course Outcomes	
CO1	After completion of the unit, students will be able to understand fundamental concepts of forensic biology.
CO2	After completion of the unit, students will be able to understand importance of hair & fiber evidences in criminal investigation.
CO3	After completion of the unit, students will be able to determine the Origin of Species from given sample.
CO4	After completion of the unit, students will be able to understand the Human Genetics & DNA
CO5	After completion of the unit, students will be able to understand investigative methods in forensic biology.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Forensic Biology	Forensic Biology: Introduction, General definition, Scope and Significance Sub Disciplines of Forensic biology, Forensic pathology, forensic Anthropology, Forensic Entomology, Forensic Odontology. Identification of blood, semen, saliva and other biological fluids. Biological characteristics- Blood and Spermatozoa. Analytical techniques for identification of blood and Semen- presumptive & confirmatory, identification of Saliva, Biological Characteristic of Saliva, other biological fluids and their identification (sweat, urine, fecal matter etc.).	8	CO1
2	Hair & Fibers	Hair & Fibers- Morphology and biochemistry of human and animal hair, and its microscopic examination, determination of origin race, sex, site, type of fiber- forensic aspect of fiber examination- fluorescent, optical properties, refractive index, birefringence, dye analysis etc. identification and comparison of man –made and natural fiber.	8	CO2
3	Determination of Origin of Species	Determination of Origin of Species: - Determination of human and animal origin from body fluids / stains viz. blood, menstrual blood, semen, saliva, sweat, pus, vomit, etc., through immuno-diffusion and immune electrophoresis, reactivity among closely related species. Serogenetic markers Blood groups – biochemistry and genetics of ABO, Rh, Mn systems, methods of ABO blood grouping from blood stains and other fluids / stains. blood specific ABH substances, determination of secretor / non secretor, Lewis's antigen, Bombay Blood group, Polymorphic enzymes typing- PGM, GLO, ESD, EAP, AK, ADA etc., and their forensic significance, HLA typing, role sero-genetic markers in individualization, paternity disputes etc.	8	CO3
4	Human Genetics & DNA	Human Genetics & DNA: - Human genetics – Heredity, Alleles, Mutations & population Genetic, History and Molecular Biology of DNA, Variations, Polymorphism DNA system – RFLP analysis, PCR amplifications, sequence polymorphism. Analysis of SNP, Y-STR, Mitochondrial DNA. DNA Profiling, Forensic Significance of DNA Profiling, Legal perspective and admissibility of DNA	8	CO4
5	Instrumental Methods	Methods- matrices supporting protein, electrophoresis, separation by molecular weight, isoelectric point, erythrocytes protein polymorphism, erythrocytes isoenzymes, hemoglobin, serum protein profiling.	8	CO5

Reference Books:

1. Richard Saferstein; Forensic Science Hand Book; Ed.; Prentice – Hall, Englewood Cliff, New jersey; (1982)
2. Dutelle, Aric W. An introduction to crime scene investigation. Jones & Bartlett Publishers, 2011

e-Learning Source:

1. <https://youtu.be/L3Bf7nHrhOQ>
2. <https://youtu.be/YY0qPxphvdk>

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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
FS502	FORENSIC BIOLOGY & SEROLOGY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from session: 2023-24							
Course Code	FS503	Title of the Course	FORENSIC ANTHROPOLOGY & ODONTOLOGY	L	T	P	C
Year	II	Semester	III	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Main objective of the subject is to develop the deep understanding about the stature of human and the importance of dental structure in forensic science.						

Course Outcomes	
CO1	After completion of the unit, students will be able to understand the scope and significance of forensic anthropology.
CO2	After completion of the unit, students will be able to understand the determination of Age, Race, Sex, and Stature.
CO3	After completion of the unit, students will be able to understand the concept of forensic anthropometry.
CO4	After completion of the unit, students will be able to understand odontology and its aspects in forensic science.
CO5	After completion of the unit, students will be able to understand the significances of bite marks in forensic investigation.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Forensic Anthropology	Forensic Anthropology: - Introduction, General Definition, Scope and Significance, Anatomy and physiology of major bones like pelvis, limb bones, skull, clavicle and sternum.	6	CO1
2	Determination of Age, Race, Sex, and Stature	Determination of Age, Race, Sex and Stature from skeletal remains Identification of sex, age, race and stature through bones, Skull, Pelvis, morphological anatomical and chemical characteristics, Personal identification through bodily features.	6	CO2
3	Forensic Anthropometry	Forensic anthropometry / Osteometry: determination of personal identity, superimposition technique, video image analysis, facial reconstruction, Identification of burnt bones, recovery and identification of skeletal remains in accident crimes and mass disasters.	6	CO3
4	Forensic Odontology	Forensic Odontology: - Introduction, General Definition, Scope and Significance Dentition, pattern, types and structure to teeth, age determination identity of person, role in mass disaster, disease of teeth and their significance in personal identification.	6	CO4
5	Bite Marks	Bite Marks: Introduction, Scope and Forensic Significance, collection and preservation of bite marks, examination, Identification and comparison and its medico legal importance.	6	CO5

Reference Books:

1. Richard Saferstein; Forensic Science Hand Book; Ed.; Prentice – Hall, Englewood Cliff, New jersey; (1982)
2. Dutelle, Aric W. An introduction to crime scene investigation. Jones & Bartlett Publishers, 2011
3. Tersigni-Tarrant, MariaTeresa A., and Natalie R. Shirley, eds. Forensic anthropology: an introduction. CRC Press, 2012

e-Learning Source:

1. <https://youtu.be/uS0tovNXyDA>
2. <https://youtu.be/-WL-toS8qAw>

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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
FS503	FORENSIC ANTHROPOLOGY & ODONTOLOGY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from session: 2023-24							
Course Code	FS504	Title of the Course	FORENSIC PSYCHIATRY AND CRIMINAL BEHAVIOR	L	T	P	C
Year	II	Semester	III	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Main objective of the subject is to develop the deep understanding about psychology involved in crime and to prepare criminal profiling based on different psychological observations.						

Course Outcomes	
CO1	After completion of the unit, students will be able to understand the basic concept of forensic psychology.
CO2	After completion of the unit, students will be able to understand the Neurobiology of Behavior
CO3	After completion of the unit, students will be able to understand the Theories of crime and factors responsible for criminal behavior.
CO4	After completion of the unit, students will be able to understand the concept of investigative psychology.
CO5	After completion of the unit, students will be able to understand the psychological disorders and insanity.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction to Forensic Psychology	Definition, Classification: Psychosomatic subtle changes, Brain activity, Collection of evidence, case history studies, observation, interviews, interrogation and experimental approach. Mental Health Act, 1987	8	CO1
2	Neurobiology of Behavior	Neurobiology of Behavior- Neurobiology of Motivation, Violence, Empathy, Deception, Aggression, Depression and Suicidal Ideation. Neurobiology of Brain Disorders. Behavioral Analysis and Neuropsychiatric Disorders Including Depression, Schizophrenia and Anxiety.	8	CO2
3	Theories of crime	Theories of crime -Biological factors, social learning theories, psychological factors. Juvenile Delinquency: Definition, Concept Juvenile delinquency.	8	CO3
4	Psychology in Interrogation	Psychology in Interrogation: Psycho-Physiological detection of deceptions, scientific, basis, methods, operational environment, application, utility, limitations, and legal status. Investigative Psychology- Criminal profiling, Polygraph, Norco Analysis, BEOS.	8	CO4
5	Psychological disorders, Insanity	Psychological disorders, Insanity: Definition, Classification, Types, Signs and Symptoms, Legal Status, Differences between true and Feigned Insanity. Procedure of Admission of Mentally Ill in Psychiatric Hospital, Discharge of Mentally Ill Person, Criminal Law and People with Mental Disorders, Civil Law and People with Mental Disorders, Procedures on Production of Mentally Ill Person in front of Magistrate.	8	CO5

Reference Books:

1. Art & science of polygraph technique :J.A Matte
2. Handbook of forensic psychology -O Donohue levensky
3. Detecting lies& Deceit-A Vrij
4. Brain Experience-C.R Mukundan

e-Learning Source:

1. <https://youtu.be/y1PmjXV9hFs>
2. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjy3c0vICLa6VYg==>

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

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

Course Code	Course Title	Attributes							SDGs No.
FS504	FORENSIC PSYCHIATRY AND CRIMINAL BEHAVIOR	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from session: 2023-24							
Course Code	FS505	Title of the Course	RESEARCH METHODOLOGY & BIOSTASTICS	L	T	P	C
Year	II	Semester	III	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Main objective of the subject is to develop the research-oriented perspective and utilitarian skill among the students of forensic science.						

Course Outcomes	
CO1	After completion of the unit, students will be able to understand the basic concepts of research methodology.
CO2	After completion of the unit, students will be able to understand research ethics and its applicability.
CO3	After completion of the unit, students will be able to understand the basic concepts of research writing.
CO4	After completion of the unit, students will be able to understand the types and collection of data.
CO5	After completion of the unit, students will be able to understand the tools and techniques for data analysis.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction to Research Methodology	An introduction to research methodology, Defining the research problem. Review of literature/use of IT & Database for ROL. Research Design–Experimental & Non-experimental. Measurement and scaling techniques. Methods of data collection. Sampling. Level of evidence.	8	CO1
2	Research Ethics	Research ethics. Writing proposal, & writing in scientific style. Use of animals in research. Critiquing article. Choosing & Developing Research question. Presenting research Proposal. Applying for research funding.	8	CO2
3	Research Writing	Writing thesis & journal article. Presenting research. Attending a scientific conference. Preparing a conference poster. Guidelines for development/ refinement, evaluation and use of assessment tools (including attitude scales): scoring, administering tests & critiquing tools. Research in rehabilitation.	8	CO3
4	Research Data	Types of data, collection, representation, measure of central tendency, variation, and association. Processing and analysis of data and Interpretation. Testing of hypothesis (parametric or standard tests of hypotheses, non-parametric or distribution-free tests). Statistical analysis for differences and correlation: Basic, Advanced special technique. Analysis of variance and covariance. 6. Multivariate analysis techniques.	8	CO4
5	Data Analysis	Sample size estimation and power calculation. Qualitative analysis. Rasch analysis. Software use for data analysis – STATA, SPSS etc. Repertory grid analysis and its application to health care research. Delphi technique (to arrive at a consensus of professional opinion on any given topic).	8	CO5

Reference Books:

1. K. Ramakant; Elementary Statistics in a world of applications, Goodyear California Pub. Co.,1979
2. K. D. Broota, Experimental designs in psychological research, Wiley eastern, New York, 1992
3. Guilford, Statistics in Psychology and Education, McGraw hill, New York, 1986
4. Katz and Kahn, Research in Behavioural Sciences, Methuen, USA, 1979
5. Research Methodology by CR Kothari

e-Learning Source:

1. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=eCJfy23Kjv3c0vICLa6VYg==>
2. <https://youtu.be/7hnCd9Q1qJI>

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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
FS505	RESEARCH METHODOLOGY & BIOSTASTICS	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from session: 2023-24							
Course Code	FS506	Title of the Course	BALLISTICS	L	T	P	C
Year	II	Semester	III	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Main objective of the subject is to develop the understanding in the field of forensic photography and forensic ballistics which includes the study of firearms and their types, firing mechanisms.						

Course Outcomes	
CO1	Students will have a deep understanding and knowledge of the historical background of firearms.
CO2	Students will be able to understand the ammunition, its classification, and compositional aspects.
CO3	Students will have a deep understanding of Internal, and External Ballistics.
CO4	Students will be able to understand the Terminal and wound ballistics.
CO5	After completion of understanding of firearms students will get to know about GSR& other components

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	History of Firearms	History and background of firearms:- Their classification and characteristics, various component of small arms, smooth bore and class characteristics, purpose of rifling, types of rifling and methods to produce rifling to produce rifling, trigger and firing mechanism, cartridge-firing mechanism, projectile velocity determination, theory of recoil, methods for measurement of recoil, techniques of dismantling / assembling of firearm, identification of origin, improvised / country-made / imitative firearm and their constructional features.	8	CO1
2	Ammunition	Ammunition: Introduction, classification and constructional features of different types of cartridges, types of primers and priming composition, propellants and their compositions, velocity and pressure characteristics under different conditions, various types of bullet and compositional aspects, latest trends in their manufacturing and design projectile, identification of origin, improvised ammunition and safety aspects for handling firearm and ammunition.	8	CO2
3	Internal & External Ballistics	Internal and External Ballistics:- Definition, ignition of propellants, shape and size of propellants, manner of burning Various factors affecting the internal ballistics: lock time, ignition time, barrel time, Equation of motion of projectile, Theory of recoil, Projectile velocity determination Principal problems of exterior ballistics, vacuum trajectory, effect of air resistance on trajectory, base drag, yaw, shape of projectile and stability, trajectory computation, ballistics coefficient and limiting velocity.	8	CO3
4	Terminal and Wound Ballistics	Terminal & Wound Ballistics: Effect of projectile on hitting the target: function of bullet shape, striking velocity, striking angle and nature of target, tumbling of bullets, effect of instability of bullet, effect of intermediate targets, influence of range Cavitations, Ricochet and wound ballistics, evaluation of injuries caused due to shot-gun, rifle, handguns and country made firearms, methods of measurements of wound ballistics parameters, post-mortem and anti-mortem firearm injuries. Threshold velocity for penetration of skin/flesh/bones, nature of wounds of entry, exit, initial track with various ranges and velocities with various types of projectiles, explosive wounds. Evaluation of injuries caused due to shot-gun, and rifle firearms, methods of measurements of wound ballistics parameters	8	CO4
5	Identification of firearms	Principles and practice of identification of firearms, different types of marks produced during firing process on cartridge and bullet. Identification of various parts of firearms, techniques for obtaining test material from various types of weapons and their linkage with fired ammunition. Various aspects to determine the range of fire. Time offering different method employed, and their limitations, stereo & comparison microscopy, automatic bullet and cartridge system, Mechanism of formation of GSR, source and collection, spot test, chemical test, identification of shooter and instrumental methods of GSR Analysis, Management and reconstruction of crime scene; suicide, murder and accidental and self-defense cases.	8	CO5

Reference Books:

1. Brian J. Heard; Hand book of Firearms and Ballistics; John Willey, England; (1997)
2. Ballistics DFS Manual, 2005
3. Forensic Laboratory Handbook procedure and practice, Ashraf Mahayana, 2011
4. Lab Manual Criminalistics An introduction to Forensic Science, Richard Saferstein (2007) Ninth Edition

e-Learning Source:

1. <https://youtu.be/hQ3kflRu0Mc>
2. <https://youtu.be/qmRq3z3zo7M>

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

CO3	3	2	2	2	3	2	3	3	3	3	2	3	2	2	2	3	3	3
CO4	3	3	3	3	3	2	3	2	3	3	2	3	2	3	3	3	3	3
CO5	3	3	3	3	2	3	3	2	2	2	3	3	3	3	3	2	3	2

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

Attributes & SDGs									
Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
FS4506	BALLISTICS	√	√	√			√	√	3,4



Integral University, Lucknow

Effective from session: 2023-24							
Course Code	FS507	Title of the Course	FORENSIC PHYSICS-LAB	L	T	P	C
Year	II	Semester	III	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of this course is to give practical exposure to the students to examine the soil, paint, and glass evidences, tool marks, cement evidences etc.						

Course Outcomes	
CO1	Students will have the practical knowledge to examine the soil, paint, and glass evidences.
CO2	Students will have the practical knowledge to examine the glass fracture.
CO3	Students will have practical knowledge to examine the cement sample
CO4	Students will have practical knowledge to examine the tool marks.
CO5	Students will have practical knowledge to restore the erased and obliterated marks.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1.	Glass Evidence & Its Forensic Examination	1. Preliminary examination of Glass evidences. 2. Examination of glass fracture. 3. To compare glass samples by refractive index method.	30 Hrs.	CO1
2.	Soil Evidence & Its Forensic Examination	4. Preliminary examination of Soil evidences. 5. To compare soil samples by refractive index method.		CO2
3.	Paint Evidence & Its Forensic Examination	6. Preliminary examination of Paint evidences. 7. Microscopic analysis of paint/ paint chips.		CO3
4.	Building material Evidence & Its Forensic Examination	8. Examination of cement sample		CO4
5.	Tool marks Evidence & Its Forensic Examination	9. Examination and comparison of tool marks on different surfaces. 10. Restoration of erased or obliterated marks on different surfaces.		CO5

Reference Books:

1.	B. Caddy, Forensic Examination of glass and paints analysis and interpretation, ISBN 078405749 2001
2.	C.E. O 'Hara and J.W. Osterburg, An Introduction to Criminalistic, Indiana University Press, Blomington, 1972
3.	Denis Shaw, Physics in the Prevention and Detection of Crime, Contem Phys. Vol.17, 1976
4.	Carper, K. (ed.), Forensic Engineering, 2ndEdn. CRC Press, Bocarida, Florida, 2001
5.	James, S.H. and Nordby, J.J. Eds., Forensic Science An Introduction to Scientific and Investigative Techniques, CRC Press, London, 2003

e-Learning Source:

1.	https://youtu.be/yHkhju99CZM
2.	https://youtu.be/LpndOfsq_6M

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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
FS507	FORENSIC PHYSICS-LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from session: 2023-24							
Course Code	FS508	Title of the Course	FORENSIC BIOLOGY & SEROLOGY-LAB	L	T	P	C
Year	II	Semester	III	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of this course is to give practical exposure to the students to examine the biological and serological evidence (blood, semen, saliva, hair and urine etc.)						

Course Outcomes	
CO1	Students will have the practical knowledge of preliminary & confirmatory examination of blood, semen, saliva, and urine.
CO2	Students will have the practical knowledge to determine the origin of species from blood.
CO3	Students will have the practical knowledge to examine the fiber & hair.
CO4	Students will have the practical knowledge to compare the hair & fiber.
CO5	Students will have the practical knowledge to conduct electrophoresis for separation.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Forensic Biology	1. Preliminary examination of Blood Stains 2. Confirmatory examination of Blood Stains 3. Confirmatory examination of Seminal Stains 4. Preliminary and confirmatory examination of saliva stains 5. Examination of sweat and urinal stains	30 Hrs.	CO1
2	Hair & Fibers	6. Identification of various type of fibers 7. Examination of human hair for cortex and medulla 8. Examination of Barr bodies from hair root 9. Comparison of hair from different body parts		CO2
3	Determination of Origin of Species	10. To Determine Blood Group from Fresh Blood and Blood Stains 11. To perform precipitin test for species of origin determination 12. To perform Immuno-diffusion test for species of origin		CO3
4	Human Genetics & DNA	13. To perform electrophoresis for separation of various polymorphic enzymes.		CO4
5	Instrumental Methods	14. To prepare gel plates for electrophoresis. 15. To perform electrophoresis for separation of Haptoglobins.		CO5

Reference Books:

- Richard Saferstein; Forensic Science Hand Book; Ed.; Prentice – Hall, Englewood Cliff, New jersey; (1982)
- Dutelle, Aric W. An introduction to crime scene investigation. Jones & Bartlett Publishers, 2011

e-Learning Source:

- <https://youtu.be/L3Bf7nHrhOQ>
- <https://youtu.be/YY0qPxphvdk>

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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
FS508	FORENSIC BIOLOGY & SEROLOGY-LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from session: 2023-24							
Course Code	FS509	Title of the Course	FORENSIC ANTHROPOLOGY & ODONTOLOGY-LAB	L	T	P	C
Year	II	Semester	III	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of this course is to give practical exposure to the students that how to determine the age from skull and teeth, pelvis. Craniometric measurements, bite marks etc.						

Course Outcomes	
CO1	Students will have the practical knowledge to determine the age from skull and teeth.
CO2	Students will have the practical knowledge to determine the sex from skull and pelvis.
CO3	Students will have the practical knowledge of osteometric measurements
CO4	Students will have the practical knowledge of craniometric measurements
CO5	Students will have the practical knowledge of comparing the bite marks.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Forensic Anthropology	1. Demonstration of pelvis bones. 2. Demonstration of skull bones	30 Hrs.	CO1
2	Determination of Age, Race, Sex, and Stature	3. Determination of Age from Skull Sutures. 4. Determination of Sex from Skull. 5. Determination of Sex from Pelvis.		CO2
3	Forensic Anthropometry	6. To Perform Osteometric measurements on long bones. 7. To Perform Craniometric measurements on skull. 8. To perform Somatometric measurement on living- (a) Height Vertex, (b) Head Length, (c) Head Breadth (d) Foot Length, (e) Foot Breadth, (f) Nasal Height, (g) Nasal Breadth, (h) External Biorbital Breadth, (i) Internal Bi-Orbital Breadth, (j) Bigonial Breadth, (k) Bizygomatic Breadth.		CO3
4	Forensic Odontology	9. Determination of Age from Teeth.		CO4
5	Bite Marks	10. Forensic examination and comparison of bite marks.		CO5

Reference Books:

1. Richard Saferstein; Forensic Science Hand Book; Ed.; Prentice – Hall, Englewood Cliff, New jersey; (1982)
2. Dutelle, Aric W. An introduction to crime scene investigation. Jones & Bartlett Publishers, 2011
3. Tersigni-Tarrant, MariaTeresa A., and Natalie R. Shirley, eds. Forensic anthropology: an introduction. CRC Press, 2012

e-Learning Source:

1. <https://youtu.be/uS0tovNXyDA>
2. <https://youtu.be/-WL-toS8qAw>

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

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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
FS509	FORENSIC ANTHROPOLOGY & ODONTOLOGY-LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from session: 2023-24							
Course Code	FS510	Title of the Course	BALLISTICS –LAB	L	T	P	C
Year	II	Semester	III	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The objective of this course is to give practical exposure to the student’s identification of firearm, bullets, comparison of different marks on firearms and fired cartridge case and bullets.						

Course Outcomes	
CO1	Students will be able to identify and recognize different types of firearms.
CO2	Students will be able to analyze the evidences relating to firearms
CO3	Students will be able to compare the cartridges and fired bullets for the identification purpose.
CO4	Students will be able to identify and compare different marks on firearms and fired cartridge case and bullets.
CO5	Students will be able to perform GSR analysis

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	History of Firearms	1. Demonstration of smooth bore firearm 2. Demonstration of rifled firearms 3. Demonstration of country made firearms	6	CO1
2	Ammunition	4. Demonstration of different types of cartridges used in rifled firearms 5. Demonstration of cartridges used in smooth bore firearms 6. Bullet comparison 7. Cartridge case comparison	6	CO2
3	Internal and External Ballistics	8. Evaluation of injuries & wound due to different firearms (Shot gun)	6	CO3
4	Terminal Ballistics	9. Evaluation of injuries & wound due to different firearms (pistol, revolver and rifle)	6	CO4
5	Identification of firearms	10. GSR analysis	6	CO5

Reference Books:

1. Brian J. Heard; Hand book of Firearms and Ballistics; John Willey, England; (1997)
2. Ballistics DFS Manual, 2005
3. Forensic Laboratory Handbook procedure and practice, Ashraf Mozayani, 2011
4. Lab Manual Criminalistics An introduction to Forensic Science, Richard Saferstein (2007) Ninth Edition

e-Learning Source:

1. <https://youtu.be/hQ3kflRu0Mc>
2. <https://youtu.be/qmRq3z3zo7M>

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

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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
FS510	BALLISTICS-LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from session: 2023-24									
Course Code	FS511	Title of the Course	SYNOPSIS- PROJECT WORK/ DISSERTATION/ THESIS			L	T	P	C
Year	II	Semester	III			0	5	0	5
Pre-Requisite	Nil	Co-requisite	Nil						
Course Objectives	Through the synopsis of Project work/Dissertation., students are expected to carry out innovative project work and prove their analytical ability and practical skills obtained in the area that they have specialized in. This course also would build the research acumen among students who are interested to pursue research as their career.								

Course Outcomes	
CO1	Students will identify the research problems associated with forensic science and criminalistics
CO2	Students will review the literatures and will be able to decide the topic.
CO3	Students will appraise the research work conducted in relation to topic chosen.
CO4	Students will decide the techniques and methodology for performing the research.
CO5	Students will present the synopsis of the topic chosen for Project work/Dissertation.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1-5	Review the literatures	1. Students are expected to decide on the specific project area and title and review the literatures of that specific topic.	30 Hrs.	CO1-CO5
	Title	2. Decide the title of the Project work/ Dissertation/ Thesis.		
	Formatting the Synopsis	3. Decide the methodology for performing the research and formatting the synopsis.		
	Presentation and viva-voce	4. Presentation of the Synopsis and viva voce examination for the same will be Conducted.		
	Final Report of Synopsis	5. The final synopsis report will be evaluated by a panel of examiners consisting of HOD, Guide, and Co-guide (wherever applicable).		

Reference Books:	
1. K. Ramakant; Elementary Statistics in a world of applications, Goodyear California Pub. Co.,1979	
2. K. D. Broota, Experimental designs in psychological research, Wiley eastern, New York, 1992	
3. Statistical Methods by S.P. Gupta.	
4. Research methodology by CR Kothari	

EVALUATION OF INTERNSHIP/ TRAINING (FOUR WEEKS)

M. FS. : Students has to prepare synopsis report and oral presentation; each student will be assessed in a 20 minutes time (15 min for presentation & 5 min for discussion).The evaluation of synopsis will be done by a panel of examiners with proper approval of concern authorities.

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

Work done during the Synopsis Period: **50**

Synopsis Report: **25**

Presentation and Viva Voce: **25**

Total: **100**

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

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

Course Code		Course Title		Attributes & SDGs						SDGs No.	
FS511	SYNOPSIS- PROJECT WORK/ DISSERTATION/ THESIS	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics			
		√	√	√			√	√		3,4	



INTEGRAL UNIVERSITY, LUCKNOW

**INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES &
RESEARCH**

DEPARTMENT OF PARAMEDICAL SCIENCES

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

SYLLABUS

YEAR/ SEMESTER: II/IV



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

Program: M.Sc. FS

Semester-IV

S . N .	Course code	Course Title	Type of Paper	Period Per hr./week/Sem			Evaluation Scheme				Sub. Total	Credit	Total Credits
				L	T	P	CT	TA	Total	ESE			
PRACTICAL													
1.	FS512	Internship/Training (Four Weeks)	Core	0	0	10	50	50	100	0	100	5	5
1.	FS513	Project work/Dissertation/Thesis	Core	0	0	40	40	20	60	40	100	20	20
Total				00	00	50	90	70	160	40	200	25	25

S. N.	Course code	Course Title	Type of Paper	Attribut es							United Nation Sustainable Development Goal (SDGs)
				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
PRACTICAL											
1.	FS512	Internship/Training (Four Weeks)	Core	√	√	√			√	√	3,4
2.	FS513	Project work/Dissertation/Thesis	Core	√	√	√			√	√	3,4

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



Integral University, Lucknow

Effective from session: 2023-24							
Course Code	FS512	Title of the Course	INTERNSHIP/ TRAINING (FOUR WEEKS)	L	T	P	C
Year	II	Semester	IV	0	0	10	5
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The Internship for students of forensic science will consist of the attachment to a FSL, CFSL, Court, Mortuary, Pharmaceutical Laboratory or Testing Laboratory for four weeks. They would observe the expert on his job as to how the investigations, are done, analysis is made and interpreted. The student is also to learn how to write the report in addition to learning the methodologies of presenting the evidence in the court.						

Course Outcomes	
CO1	Through this form of training/internship, the students would be exposed to the actual on the fieldwork carried out on the area of forensic and allied sciences.
CO2	Students will be able to acquire knowledge regarding handling of various equipment's for their analytical work pertaining to research or case-related work.
CO3	Students will be able to appraise the legal framework of crime investigation
CO4	Students will be able to appraise the judicial proceeding in crime investigations and visualize the working of forensic experts
CO5	The student will learn how to write the report in addition to learning the methodologies of presenting the evidence in the court.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1-5	Work done during the Internship/ Training Period	Preparation of the report of work done during training period in FSL, CFSL, Court, Mortuary, Pharmaceutical Laboratory or Testing Laboratory, Private Forensic Science Laboratories etc.	4 Week	CO1-CO5
	Internship Report	Making the internship/ training report after the completion internship/ training period.		
	Presentation/Viva Voce	Presentation/ Viva-voce of the work done during training period		

EVALUATION OF INTERNSHIP/ TRAINING (FOUR WEEKS)

M. FS. : Students has to prepare internship report during their training period. The evaluation for internal examination of 100marks will be distributed:

Work done during the Internship Period: 50

Internship Report: 25

Presentation and Viva Voce: 25

Total: 100

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

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

Course Code		Course Title		Attributes & SDGs							SDGs No.	
FS512		INTERNSHIP/ TRAINING (FOUR WEEKS)		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
				√	√	√			√	√	3,4	



Integral University, Lucknow

Effective from session: 2023-24							
Course Code	FS513	Title of the Course	PROJECT WORK/DISSERTATION/THESIS	L	T	P	C
Year	II	Semester	IV	0	40	0	20
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Through the Project work/ Dissertation, students are expected to prove their analytical ability and practical skills obtained in the area that they have specialized in. This course also would build the research acumen among students who are interested to pursue research as their career.						

Course Outcomes	
CO1	Students will identify the research problems Apply the principles of research and biostatistics in research studies associated with forensic science and criminalistics
CO2	Plan and execute a research study, including collection and analysis of data/ samples
CO3	The students will be able to establish a methodology using advanced tools / techniques for solving the problem including project management and finances.
CO4	The students will be able to prepare the research report and its oral demonstrations
CO5	The students will be gain practical experience in project management in forensic science, be able to use various techniques in contemporary research for project, perform numerical analysis and interpret the results

Name of Student:			Session:	
Enrollment Number:			Date	
Name of Subject:		PROJECT WORK/DISSERTATION/THESIS	Subject code:	FS513
Topics:				
S. No.	Evaluation	Point to be Considered	Max. Marks	Marks Obtained
1.	On the basics of continuous assessment (10 Marks)	Periodic Consultation with Guide	2	
2.		Regular collection of Data with the consultation of guide.	2	
3.		Command of the topic & presentation skill	2	
4.		Methods, analysis, dissuasion and Conclusions	2	
5.		Contribution to knowledge and thesis structure	2	
Review all heading				
1.	On the basics of External Evaluators at the time of End Semester Examination.	Introduction	3	
2.		Aims, objectives & research hypothesis	3	
3.		Review of literature	3	
4.		Material & Methods	3	
5.		Data analysis & results	3	
6.		Discussion, lamination & future study	3	
7.		Conclusion, signification.	3	
8.		Bibliography	3	
9.		Tables, graph, diagram & Annexure (if any) Statistical Analysis Master Chart	3	
10.		The deface of study	3	
Total Score:			40	

Note: Evaluation of Dissertation of MFS- Students has to prepare oral presentation; each student will be assessed in a 20 minutes time (15 min for presentation & 5 min for discussion). The evaluation of dissertation by external examiner with proper approval of concern authorities. The end semester examination will be 40 marks as external evaluations and 60 marks will be by the internal examiner (continuous assessment):

Comments/Suggestions:

(Name and signature of Incharge)

(Head, Paramedical)

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

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

Attributes & SDGs

Course Code	Course Title	Attributes	SDGs
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Integral University, Lucknow

FS513	PROJECT WORK/DISSERTATION/ THESIS	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.
		√	√	√			√	√	3,4,9, 17