TheoryPaper:SchemeB-1forTwo YearPG Program				
Program:	**Class:**M.Sc.III Semester	**Year: 2025**	**Session:2025-26**	
Subject:**Forensic Science**				
1	CourseCode	CC-31		
2	Course Title	**Forensic Biology, Serology, DNA and Forensic Medicine: Theory**		
3	Course Type			
4	Pre-Requisite(if any)			
5	CourseLearning Outcome(CLO)	To understanding of the nature and importance of cells in the human body and differentbiological materials and their examination also importance of autopsy, knowledge on different types of injury and wound, the differenttechniques of facial reconstruction and their forensic importance, importance of forensic Medicine.		
6	Credit Value	6		
7	TotalMarks	Max.Marks: 100	Minimum PassingMarks: 40	

TotalNo.OfLectures-Tutorial-Practical(inhoursperweek): L-T-P:

Unit	Topics	No. OfLectures
I	Definition, Meaning, and History of Histology. Cell: Definition, Theories, Classification and Significance of Cells in Forensic Science. Cell Organelles and their Functions, Difference between Eukaryotic and Prokaryotic Cell, Difference between Plant and Animal Cell. Cell Division: Definition, Types, Difference between Somatic, Germinal Cell, Totipotency and Apoptosis. Basic Concept in Brief for Anatomy and Physiology of Digestive, Respiratory, Circulatory, Skeleton, Nervous, Excretory, and Reproductive System, etc. Definition, Classification, General Properties of amin acids, proteins and carbohydrates.	14
II	History, Biochemistry and Genetics of ABO, Rh, Mn, and other Systems, Methods of ABO Blood Grouping (Absorption-Inhibition, Mixed Agglutination, And Absorption Elution) from Blood Stains and other Body Fluids/Stains, Determination of Secretor/Non-Secretor Status, Lewis Antigen, Bombay. Blood Spatter Pattern Identification, Identification of Menstrual and Other Stains by Various Methods. Semen: Composition, Structure of Spermatozoa, Forensic Methods of Detection and Identification of Semen and Seminal Stain. Origin of Species: Determination of Human and Animal Origin from Bones, Hair, Flesh, Nails, Skin, Teeth, Body Tissue, Fluids/Stains viz. Blood, Menstrual Blood, Semen, Saliva, Sweat, Tear, Pus, Vomit, etc., Through Immuno-Diffusion and Immuno-Electrophoresis, Cross Reactivity among Closely Related Species. Immunology: Immune System, Immune Response, Epitopes, Paratopes, Haptens and Adjuvant, Antigens and Antibodies, Antigen-Antibody Reaction.	22

III	Mendel Ion Genetics, Genotypes, Phenotypes, Mutation, Multiple Alleles. Biochemical Markers of Individuality: General Understanding, Classification of Markers, Biochemical Basis of Genetic Variation. Structure of DNA, Damage to DNA, Variation in DNA, DNA as Excellent Polymorphic Marker, and Sources of DNA as Forensic Evidence. Different Extraction Techniques of DNA, Basic DNA Typing Techniques; RFLP, PCR, Electrophoresis, and Detection Methods. Polymorphic Enzymes Typing- PGM, ESD, EAP, AK, etc., and their Forensic Significance, HLA Typing, Role of Serogenetic Markers in Individualization, Paternity Disputes, etc.	18
IV	Definition, Developmental History, Brief knowledge about legal procedures in courts, inquests, criminalcourts and their powers, subpoenas, and oaths of medical experts. Recording of Medical Experts'Evidence in Courts. Types of Medical Evidence, Kinds of Witness, and Rules for Giving Evidence.Definition and Importance of Personal Identification. Parameters Contributing to Personal Identity-Race, Sex, Age, Complexion, Features &Photographs, Anthropometric measurements etc.	18
V	Thanatology: Definition, Meaning, Death, Type of Death, Concept of Death, Modes of Death and theirCauses and Sign (Immediate Changes, Early Changes, Late Changes) and Symptoms, Manner of Death,Cause of Death,Asphyxia Death, Suspended Animation and Medico LegalImportance of Death.Autopsy: Definition, Classification, Concepts, Objectives, Legal Formalities for Autopsy, AutopsyProcedure, Skin Incisions, etc. Post-Mortem Examination: Importance, Post-Mortem Report Format,External & Internal Examination in Brief. Viscera & Its Preservation. Examination of Asphyxia Death,Examination of Decomposed and Mutilated Bodies. Precautions to be taken during Post MortemExamination. Injuries: Definition, classification, Mechanical Injuries (Abrasion, Contusion, Laceration, Fracture andDislocation of Bone/ Teeth, Incised Wounds, Chop Wound, Stab Wounds and Firearm Wounds),Regional Injuries, Thermal Injuries (Injuries due to Cold and Heat), Chemical Injuries, MiscellaneousInjuries.Medico-Legal Aspects, Post Mortem& Ante Mortem Wounds, General Characteristics ofInjuries from Burns, Scalds, Lightning, Electricity and Radiation. **Ancient legal medicine practices: Injury classification; *Abhighata*, *Vrana*, *Chinna*, *Bhinna*, etc. Cause and manner of death analysis (*Marma points*, vital organ injuries).**	18

Keyword/Tag: DNA, Injuries,Genetics,Post Mortem

TextBooks,ReferenceBooks,Other Resources

Suggested Readings:

1. Albert S., Bray B. Lewis D, Roberts K. & Watson J.D. (1989). Molecular Biology of Cell. New York, Garland Pub.
2. Ball S., (1991). Environmental Law – The Law and Policy relating to Protection of Environment. India, Universal Law Pub Co, Delhi.
3. Biology Methods Manual (1978). London, Metropolitan Police Forensic Science Laboratory Pub.
4. Catts E.P. & Haskell N.H. (1990). Entomology and Death: A Procedural Guide. London, Joyce's Print Shop.
5. Clifford &B.J.(1971). The Examination and Typing of Bloodstains in the Crime Laboratory. USA, US Court Printing Press.
6. Edwin & Caney H. M. (1993). Human Genetics: The Molecular Revolution. London, Jones & Bartlett Pub.
7. Gardner E.J., Simmons M. I. &SnustadD.P.(1991). Principles of Genetics. New York, John Wiley.
8. Jason P. J. & Simpson K. (2014).Simpson's Forensic Medicine, NY, CRC Press.
9. Mallet X. (2014). Advances in Forensic Human Identification. NY, CRC Press.
10. Modi J.S. (2011). Medical Jurisprudence and Toxicology, India, Law Publishers.
11. Molina D. K., & M.D. (2009). Handbook of Forensic Toxicology for Medical Examiners. USA,CRC Press.

SuggestedContinuousEvaluation Methods:
Maximum Marks: 100
ContinuousComprehensiveEvaluation(CCE): 40 **UniversityExam (UE): 60**

InternalAssessment	Marks	External Assessment	Marks
Mid-Semester Test	20	Term End Exam	60

PracticalPaper:SchemeB-1 forTwoYearPG Program

(MST)			
Teacher Assessment* (TA) and Class attendance	20		
Total	40		60

Teacher Assessment* Presentation/Assignment/Quiz/Group-Discussion etc.

Program:	Class:M.Sc.IIISemester	Year: 2025	Session:2025-26

Subject:**Forensic Science**		
1	CourseCode	PC-31
2	Course Title	**Forensic Biology, Serology, DNA and Forensic Medicine: Practical**
3	Course Type	
4	Pre-Requisite(if any)	
5	CourseLearning Outcome(CLO)	Understanding about Blood/ blood group examination, origin of species by hair samples,identification of fibres by physical and chemical methods, microscopic examination of pollenand diatoms.
6	Credit Value	4

	TotalMarks	Max.Marks: 100	Minimum PassingMarks:40

TotalNo.OfLectures-Tutorial-Practical(inhoursperweek): L-T-P:

Topics	
1. Primary and Confirmatory Examination of Blood/ Semen Samples. 2. Microscopic Examination of Seminal Stains for the Detection of Spermatozoa. 3. Identification of Species from the Hair Sample. 4. Examination of Fiber by Physical and Chemical Methods. 5. Determination of species from Blood Samples. 6. Detection & Examination of Salivary Stains. 7. Draw and label the bones of the human body. 8. Determination of Age and Sex of a Person from Long Bones. 9. Determination of Age and Sex of a Person from Skull. 10. Recording of Bite Marks by Casting& their Photography. 11.Collection and Identification of Pollen Grains, Diatoms of Forensic Importance. 12. Examination of Lip Prints.	**No.OfLectures**

Keyword/Tag: DNA, Injuries,Genetics,Post Mortem

TextBooks,ReferenceBooks,Other Resources

Suggested Readings:

1. Albert S., Bray B. Lewis D, Roberts K. & Watson J.D. (1989). Molecular Biology of Cell. New York, Garland Pub.
2. Ball S., (1991). Environmental Law – The Law and Policy relating to Protection of Environment. India, Universal Law Pub Co, Delhi.
3. Biology Methods Manual (1978). London, Metropolitan Police Forensic Science Laboratory Pub.
4. Catts E.P. & Haskell N.H. (1990). Entomology and Death: A Procedural Guide. London, Joyce's Print Shop.
5. Clifford &B.J.(1971). The Examination and Typing of Bloodstains in the Crime Laboratory. USA, US Court Printing Press.
6. Edwin & Caney H. M. (1993). Human Genetics: The Molecular Revolution. London, Jones & Bartlett Pub.
7. Gardner E.J., Simmons M. I. &SnustadD.P. (1991). Principles of Genetics. New York, John Wiley.
8. Jason P. J. & Simpson K. (2014). Simpson's Forensic Medicine, NY, CRC Press.
9. Mallet X. (2014). Advances in Forensic Human Identification. NY, CRC Press.
10. Modi J.S. (2011). Medical Jurisprudence and Toxicology, India, Law Publishers.
11. Molina D. K., & M.D. (2009). Handbook of Forensic Toxicology for Medical Examiners. USA,CRC Press.

SuggestedContinuousEvaluation Methods:
Maximum Marks: 100
ContinuousComprehensiveEvaluation(CCE): 40 **UniversityExam (UE): 60**

InternalAssessment	Marks	External Assessment	Marks
Internal Test, Teacher Assessment* (TA) and Class Attendance	40	Term End Exam	60
Total	40		60

Teacher Assessment* Demonstration/Viva-Voce/Lab record etc.

TheoryPaper:SchemeB-1forTwo YearPG Program				
Program:	**Class:**M.Sc.IIISemester	**Year: 2025**	**Session:2025-26**	
Subject:**Forensic Science**				
1	CourseCode	CC - 32		
2	Course Title	**Forensic Chemistry ToxicologyandPharmacology: Theory**		
3	Course Type			
4	Pre-Requisite(if any)			
5	CourseLearning Outcome(CLO)	To understanding of the nature and importance of cells in the human body and differentbiological materials and their examination also importance of autopsy, knowledge on different types of injury and wound, the differenttechniques of facial reconstruction and their forensic importance, importance of forensic Medicine.		
6	Credit Value	6		
7	TotalMarks	Max. Marks: 100	Minimum Passing Marks:100	

TotalNo.OfLectures-Tutorial-Practical(inhoursperweek): L-T-P:

Unit	Topics	No. OfLectures
I	Introduction, Concept, and Significance. Poisons: Definition, Classification of Poisons, Types of Poisoning, Mode of Action, Factors Modifyingthe Action of Poisons, Toxicological Exhibits in Fatal and Survival Cases, Their Preservation,Treatment in Cases of Poisoning, Analysis Report.General Study and Analysis- Alkaloids: Definition, Classification, Isolation and General Characterization. Vegetable Poison: General Studies and Analysis of Some Vegetable Poisons, Opium, Abrus,yanogenetic Glycosides, Dhatura, Marking Nuts, Nux-Vomica, Oleander Aconite, etc. **Ancient classification of Poison: Sthavara (plant-based), Jangama (animal-based), Krtrima (artificial/compound poisons)** **Traditional detoxification and antidotes:** • **Agada (antidote formulations)** • **Vamana (emesis), Virechana (purgation), Swedana (sweating) – therapeutic detox protocols**	14

II	Extraction, Isolation and Clean-Up Procedures- Extraction of Non-Volatile Organic Poison, Stas-Otto,Dovbriey Nickolls(AmmoniumSulphate) Method, Acid Digest and Valov (Tungstate) Methods, Solid Phase MicroExtraction Techniques, Solvent Extraction Methods. Volatile Poisons: Industrial Solvent Acid and Basic Distillation.Toxic Cations: DryAshing and Wet Digestion Process.Toxic Anions: Dialysis Method, Total Alcoholic Extract.	22
III	Barbiturates, Methaqualone,Hydromorphine, Methadone, Meprobamate, Mescaline,Amphetamines, LDS, Heroin, Cannabinoids, Phinothiazines. Insecticides: Types, General Methods for their Analysis. Metallic Poisons: Arsenic, Mercury, Lead, Bismuth, Copper, Aluminium, Iron, Barium, Zinc,Snake Venoms and Other Animal Poisons, Irrespirable Gases, etc. Pharmacological Studies: Absorption, Distribution, Metabolism, Pathways of DrugMetabolism. Pharmacodynamics: Introduction, Nature & Scope.	18
IV	Forensic Chemistry and its Scope, Analysis of Beverages: Alcohol and Non-Alcoholic,Country Made Liquor etc. Adulterated food material. Drugs of Abuse: Introduction,Classification, Narcotic Drugs & Psychotropic Substances, Sampling, Specific Drugs Types(Cannabis, Heroin, Cocaine, Amphetamine), Drugs of Abuse in Sports. Brief Introduction toDrugs and Cosmetic Act, Excise Act, NDPS Act. An Overview of Clandestine Laboratories.Recent Advancement in Drugs: Rave Drugs, Drug Designing, Doping, Drug DiscoveryProgram, Structural Modification in Drugs, and Drug Monitoring Agencies.	18
V	Examination of Petroleum Products: Distillation &Fractionation, Various Fractions and theirCommercial Uses. Standard Methods of Analysis of Petroleum Products for Adulteration. TrapCases: Purpose, Examination of Chemicals Used in Trap Case.Classificationexplosives and their Examination.Examination of Building Materials: Types of Cement and their Composition, Determination ofAdulterants by Physical, Chemical and Instrumental Methods, Examination of Brick, Analysisof Cement Mortar and Concrete, Analysis of Gold and Other Metals in Cheating Cases.	18
Keyword/Tags: Toxicology, Poison, Drug, Examination		

PracticalPaper:SchemeB-1 forTwoYearPG Program

TextBooks,ReferenceBooks,Other Resources

Suggested Readings:

1. Aggrawal A. (2016). Textbook of Forensic Medicine and Toxicology. India, AvichalPublishing Company.
2. Bardale R. (2011). Principles of Forensic Medicine & toxicology. India, Jaypee BrothersMedical Publishers (P) Ltd.
3. Krishan V. (2014).Textbook of Forensic Medicine & Toxicology: Principles & Practice.UK, Elsevier Health Sciences.
4. Modi J.S. (2011).Medical jurisprudence and Toxicology. India, Law Publishers.8. Jason P. J. & Simpson K. (2014).Simpson's Forensic Medicine, NY, CRC Press.
5.Chatwal and Anand. (2016). Instrumental Methods of Chemical Analysis. India, HimalayaPublishing House Pvt. Ltd.
6. Churáček J. (1993). Advanced Instrumental Methods of Chemical Analysis. Michigan, E.Harwood,
7. Dean J. A. (1995). Analytical Chemistry Handbook. USA, McGraw Hill Inc

SuggestedContinuousEvaluation Methods:
Maximum Marks: 100
ContinuousComprehensiveEvaluation(CCE): 40 **UniversityExam (UE): 60**

InternalAssessment	**Marks**	**External Assessment**	**Marks**
Mid-Semester Test (MST)	20	Term End Exam	60
Teacher Assessment* (TA) and Class attendance	20		
Total	40		60

Teacher Assessment* Presentation/Assignment/Quiz/Group-Discussion etc.

Program:	Class:M.Sc.III Semester	Year: 2025	Session:2025-26
Subject:**Forensic Science**			
1	CourseCode	PC - 32	
2	Course Title	**Forensic Chemistry ToxicologyandPharmacology: Practical**	
3	Course Type		
4	Pre-Requisite(if any)		
5	CourseLearning Outcome(CLO)	Understanding about different Vegetable Poisons, Extraction and Identification of Insecticides and Pesticides, Identification of Drugs/ Toxicants, Identification of Metallic Poisons from Viscera.	
6	Credit Value	4	
	TotalMarks	Max.Marks: 100	Minimum PassingMarks:40

TotalNo.OfLectures-Tutorial-Practical(inhoursperweek): L-T-P:

Topics	**No.OfLectures**
1. Identification of Common Plants i.e., Calotropis, Cannabis, Dhatura, Nux-Vomica, MarkingNut, Abrus precatorius, Opium Poppy etc. by Physical Examination and Color Test. 2. Identification of Different Vegetable Poisons by Thin Layer Chromatography etc. 3. Extraction and Identification of Insecticides and Pesticides by Colour Test/TLC. 4. Extraction and Identification of Drugs/ Toxicants from Biological Matrix and their Detection. 5. Identification of Salts and Metals by Simple Color Test in Case of Metallic Poisoning. 6. Extraction and Identification of Metallic Poisons from Viscera Using Dry Ashing MethodFollowed by Reinsch'sTest. 7.Preliminary & Confirmatory Examination of Chemicals Used in Trap Cases. 8.Preliminary & Confirmatory Examination of the Chemicals Seized in Case of Acid Attack. 9. Estimation Analysis of Petroleum Products using different methods like Density,Viscosityetc. 10. Detection of Adulterants in Cement Samples. 11. Determination of Percentage of Proof Sprit of Ethyl Alcohol in Illicit Liquorby UV-VIS Spectrophotometry. 12. Separation and Identification of Volatile Liquid by Simple Distillation. 13. Preliminary Examination Black Powder.	

Keyword/Tags: Toxicology, Poison, Drug, Examination

TextBooks,ReferenceBooks,Other Resources

Suggested Readings:

1. Aggrawal A. (2016). Textbook of Forensic Medicine and Toxicology. India, Avichal Publishing Company.
2. Bardale R. (2011). Principles of Forensic Medicine & toxicology. India, Jaypee Brothers Medical Publishers (P) Ltd.
3. Krishan V. (2014).Textbook of Forensic Medicine & Toxicology: Principles & Practice. UK, Elsevier Health Sciences.
4. Modi J.S. (2011).Medical jurisprudence and Toxicology. India, Law Publishers.
5. Khandpur R.S. (2004).Handbook of Analytical Instruments. USA, Tata McGraw Hill Pub. Co.
6. Khanna D.R. &Gulati H.R. (2002). Fundamentals of Optics Geometrical Physical & Quantum. India, R. Chand & Co.
7. Patania V.B. (2004). Spectroscopy. India, Campus Books International.
8. Robinson J.W. (1996). Atomic Spectroscopy, Revised & Expanded. NY, Marcel Dekkar, Inc.

SuggestedContinuousEvaluation Methods:
Maximum Marks: 100
ContinuousComprehensiveEvaluation(CCE): 40 **UniversityExam (UE): 60**

InternalAssessment	Marks	External Assessment	Marks
Internal Test, Teacher Assessment* (TA) and Class Attendance	40	Term End Exam	60
Total	40		60

Teacher Assessment* Demonstration/Viva-Voce/Lab record etc.

Internship/ Apprenticeship/ Seminar (2 Credits)

TheoryPaper:SchemeB-1forTwo YearPG Program

SuggestedContinuousEvaluation Methods:
Maximum Marks: 100

- **Seminar: Internal Evaluation only**
- **Internship/ Apprenticeship: Marks to be allotted by the concerned organiaztion**

Program:	Class:M.Sc.IV Semester	Year: 2025	Session:2025-26

Subject: **Forensic Science**

1	CourseCode	CC-41	
2	Course Title	**Emerging Trends in Forensic Science Theory**	
3	Course Type		
4	Pre-Requisite(if any)		
5	CourseLearning Outcome(CLO)	Understanding Modern Surveillance Tools, Advancements in Detection of Street Drugs, Geo-Forensics, Environmental Forensics, Wildlife Forensics.	
6	Credit Value	6	
7	TotalMarks	Max. Marks: 100	Minimum Passing Marks: 40

TotalNo.OfLectures-Tutorial-Practical(inhoursperweek): L-T-P:

Unit	Topics	No. OfLectures
I	Modern Surveillance Tools: Surveillance using biometrics, ID cards, and communications data Security Tools- Types (Airborne, Deployable, Fixed, Mobile, etc.), Advantages and Disadvantages.	18
II	Advancements in Detection of Street DrugsKitbased detection, Instrument Advancements in Drugs, Hyphenated Chromatographic, 2D GasChromatography, Electronic Nose, Advance Kits, Drug Early warning system, Non invasive matrix indrug detection, Non-Conventional Substance of Abuse..	18
III	Forensic Geology Types of soil evidence, Color analysis, Particle analysis, Mineralogical analysis, Major and traceelement composition, Procedures for soil and sediment sampling and storage, Analysis of gems/ coloredstones, Evaluation of the significance of geological evidence.	18

IV	Environmental Forensics Introduction, Environmental pollutants, Toxicity of environmental contaminants, Fate of chemicals inthe environment, Bioconcentration, Bioaccumulation and Biomagnification,contamination, atmospheric dispersion of pollutants.	18
V	WildLife ForensicsIntroduction to Wildlife, Protected and Endangered Species of Animals and Plants, WildLife Species -Identification and Examination of Physical Evidence by Conventional and Modern Methods,Identification of Pug Marks of Various Animals, Wildlife Census, Wildlife and Environment ProtectionAct.	18
Keywords/Tags: Forensics, Tools Wildlife, Toxicity, Pollutants		

TextBooks,ReferenceBooks,Other Resources

Suggested Readings:

1. Murray, R.C. (2004). Evidence from the Earth: Forensic Geology and Criminal Investigation.

Mountain Press, Publishing Company, Missoula, Montana.

2. Petraco, N., Kubic, T. (2000). A density gradient technique for use in forensic soil analysis. Forensic

Science International.

3. Reynolds, J.M. (1997). An introduction to applied and environmental geophysics. John Wiley &

Sons, Ltd, Chichester.

4. Wildlife DNA Analysis: Applications in Forensic Science. (2013, May 28). Wiley.Com

PracticalPaper:SchemeB-1 forTwoYearPG Program

SuggestedContinuousEvaluation Methods: **Maximum Marks: 100** **ContinuousComprehensiveEvaluation(CCE): 40**			**UniversityExam (UE): 60**
InternalAssessment	**Marks**	**External Assessment**	**Marks**
Mid-Semester Test (MST)	20	Term End Exam	60
Teacher Assessment* (TA) and Class attendance	20		
Total	40		60

Teacher Assessment* Presentation/Assignment/Quiz/Group-Discussion etc.

Program:	Class:M.Sc.IVSemester	Year: 2025	Session:2025-26

Subject:**Forensic Science**		
1	CourseCode	PC-41
2	Course Title	**Emerging Trends in Forensic Science Practical**
3	Course Type	
4	Pre-Requisite(if any)	
5	CourseLearning Outcome(CLO)	Understanding about different Vegetable Poisons, Extraction and Identification of Insecticides and Pesticides, Identification of Drugs/ Toxicants, Identification of Metallic Poisons from Viscera.
6	Credit Value	4

	TotalMarks	Max.Marks:100	Minimum PassingMarks: 40

TotalNo.OfLectures-Tutorial-Practical(inhoursperweek): L-T-P:

Topics	
1. Pugmark Identification and characterization of common large mammals. 2. Use of different techniques in identification of different parts and products of flora and fauna reportedin the wildlife trade. 3. To identify drugs of abuse by spot tests/rapid test kit. 4. To separate drugs of abuse by thin layer chromatography. 5. Comparison of soil samples.	**No.OfLectures**

Keywords/Tags: Forensics, Tools Wildlife, Toxicity, Pollutants

TextBooks,ReferenceBooks,Other Resources

Suggested Readings:

1. Murray, R.C. (2004). Evidence from the Earth: Forensic Geology and Criminal Investigation.

Mountain Press, Publishing Company, Missoula, Montana.

2. Petraco, N., Kubic, T. (2000). A density gradient technique for use in forensic soil analysis. Forensic

Science International.

3. Reynolds, J.M. (1997). An introduction to applied and environmental geophysics. John Wiley &

Sons, Ltd, Chichester.

4. Wildlife DNA Analysis: Applications in Forensic Science. (2013, May 28). Wiley.Com

SuggestedContinuousEvaluation Methods:
Maximum Marks: 100
ContinuousComprehensiveEvaluation(CCE): 40 **UniversityExam (UE): 60**

InternalAssessment	Marks	External Assessment	Marks
Internal Test, Teacher Assessment* (TA) and Class Attendance	40	Term End Exam	60
Total	40		60

Teacher Assessment* Demonstration/Viva-Voce/Lab record etc.

TheoryPaper:SchemeB-1forTwo YearPG Program			
Program:	**Class:**M.Sc.IVSemester	**Year: 2025**	**Session:2025-26**
Subject:**Forensic Science**			
1	CourseCode	CC-42	
2	Course Title	**Forensic Neuroscience&Behavior, Narcotics and Drugs of Abuse: Theory**	
3	Course Type		
4	Pre-Requisite(if any)		
5	CourseLearning Outcome(CLO)	Understanding the neuroscience behind drug addiction and brain functionAnalyzing the behavioral patterns of substance abuse and its forensic implicationsApplying knowledge of neurobiology to investigate drug-related crimesDeveloping expertise in interpreting evidence related to narcotics and substance abuse.	
6	Credit Value	6	
7	TotalMarks	Max. Marks: 100	Minimum Passing Marks: 40

TotalNo.OfLectures-Tutorial-Practical(inhoursperweek): L-T-P:

Unit	Topics	No. OfLectures
I	Forensic Neuroscience- Introduction to Forensic Neuroscience; Neuroscience in Criminal Investigation andJustice System.Introduction to the Structure and Function of the Vertebrate Nervous System.Anatomy of Nervous System, Neurons, Synapse and Neurotransmitter. CellularBasis of Neuronal Activities, Physiological Bases of Motor Control, SensorySystems, Motivated Behaviors and Higher Mental Processes. **Trigunas (Three qualities of mind):** • ***Sattva* (purity, harmony), *Rajas* (activity, passion), *Tamas* (inertia, ignorance) – their role in criminal tendencies.**	18
II	Action Potential Generation, Synaptic Transmission, Molecular and Physiological Studies of Ion Channels, Second Messengers, Simple Neural Circuits, Synaptic Plasticity, Learning and Memory, and Neural Development. Neurobiology of Motivation, Violence, Empathy, Deception, Aggression, Depressionand Suicidal Ideation. Neurobiology of Brain Disorders. Behavioral Analysis andNeuropsychiatric Disorders Including Depression, Schizophrenia and Anxiety.	18

III	Principles of Brain Imaging and Rules of Scientific Evidence. BehavioralNeuroscience and Brain Imaging Techniques, Functional and Structural Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET), Role ofBehavioral Sciences in Courtroom Decision-Making. Use of BehavioralNeuro-Evidence in the Justice System. Evaluation of Brain Imaging and other NeuroscienceData in Forensic and Legal Settings.	18
IV	Narcotics Drugs and Psychotropic Substances, Narcotics, Drug and Cosmetics Act,Classification and Characteristics of Narcotics Drugs, Legal Issues and Challenges. Types and Classification of Drugs, Drugs of Abuse, Drug Addiction, DrugDependency; Synergistic Effect of Drugs, Drug Trafficking, Safety Measures and Precautions. **Traditional use of psychoactive substances in spiritual, medicinal, and recreational contexts:** • **Bhang, Soma, Datura, Cannabis, Opium, and other plant-based intoxicants.**	18
V	Barbiturates, Methaqualone, Hydromorphine, Methadone, Meprobamate, Mescaline,Amphetamines, LDS, Heroin, Cannabinoids, Phinothiazines.Forensic Examination of Drugs of Abuse.Rave Drugs, Drug Designing, Doping, Drug Discovery Program, StructuralModification In Drugs, Drug Monitoring Agencies.	18
Keywords/Tags: Drugs, Abuse, Brain, Neuroscience		

TextBooks,ReferenceBooks,Other Resources

Suggested Readings:

1. Andreasen N. C. (1989). Brain Imaging: Applications in Psychiatry. USA, American Psychiatric Pub.
2. Benarroch E. E. (2006). Basic Neurosciences with Clinical Applications. USA, Elsevier.
3. BohlenO. V., Halbach&Dermietzel R. (2006). Neurotransmitters and Neuromodulators: Handbook of Receptors and Biological Effects. England, John Wiley & Sons.
4. Davies G.M. &Beech A.R. (2012). Forensic Psychology: Crime, Justice, Law Interventions. England, John Wiley & Sons.
5. Flanagan C. (2008). Psychology: Complete Study and Revision Guide. England,

Letts and Lonsdale.
6. Hall H. V. (2007).Forensic Psychology and Neuropsychology for Criminal and Civil Cases. NY,CRC Press.
7. Hauser P. (1991). Brain imaging in affective disorders. USA, AmericanPsychiatric Press
8. Aggrawal A. (2016). Textbook of Forensic Medicine and Toxicology. India,Avichal Publishing Company.
9. Burger A. (2004). Medicinal Chemistry & Drug Discovery. NY, John Wiley & Sons.

SuggestedContinuousEvaluation Methods:
Maximum Marks: 100
ContinuousComprehensiveEvaluation(CCE): 40 **UniversityExam (UE): 60**

InternalAssessment	**Marks**	**External Assessment**	**Marks**
Mid-Semester Test (MST)	20	Term End Exam	60
Teacher Assessment* (TA) and Class attendance	20		
Total	40		60

Teacher Assessment* Presentation/Assignment/Quiz/Group-Discussion etc.

PracticalPaper:SchemeB-1 forTwoYearPG Program				
Program:	**Class:**M.Sc.IVSemester		**Year: 2025**	**Session:**2025-26
Subject:**Forensic Science**				
1	CourseCode	PC-42		
2	Course Title	**Forensic Neuroscience&Behavior, Narcotics and Drugs of Abuse:Practical**		
3	Course Type			
4	Pre-Requisite(if any)			
5	CourseLearning Outcome(CLO)	Understanding the neuroscience behind drug addiction and brain function Analyzing the behavioral patterns of substance abuse and its forensic implicationsApplying knowledge of neurobiology to investigate drug-related crimesDeveloping expertise in interpreting evidence related to narcotics and substance abuse.		
6	Credit Value	4		
	TotalMarks	Max.Marks:100	Minimum PassingMarks:40	
TotalNo.OfLectures-Tutorial-Practical(inhoursperweek): L-T-P:				
Topics				**No.OfLectures**
1. Identification of Common Plant i.e. Cannabis, Tobacco and OpiumPoppy by Morphological Features. 2. Preliminary Examinationof Drugs Used for Committing Drug Facilitated Sexual Assaults. 3. Systematic Extraction and Identification of Narcotic/ Sedative/ Tranquilizer Drugs from Viscera/ Blood/ Urine (Simulated Sample). 4. Separation of Abusive Drugs from the Suspected Sample byHPLC. 5. Extraction of The Alcohol Content from the Country Made Liquor Using Simple Distillation Technique and its Preliminary Examination. 6. Examination of Drugs of Abuse by UV-Vis Spectrophotometer.				
Keywords/Tags: Drugs, Abuse, Brain, Neuroscience				

TextBooks,ReferenceBooks,Other Resources

Suggested Readings:

1. Working Procedure Manual – Chemistry, Explosives and Narcotics(2000). India, BPR&D Pub.
2. Aggrawal A. (2016). Textbook of Forensic Medicine and Toxicology. India,Avichal Publishing Company.
3. Burger A. (2004). Medicinal Chemistry & Drug Discovery. NY, John Wiley & Sons.
4. Clark E.G.C. (1986). Isolation and Identification of Drugs, Vol. I and Vol. II. Britain, Academic Press.
5. Connors K.A. (1975). A Text Book of Pharmaceuticals analysis. New York, Inter Science Pub.
6. Davies S., Johnston A. & Holt D. (2016).Forensic Toxicology: Drug Use and Misuse. England,Royal Society of Chemistry.

SuggestedContinuousEvaluation Methods:
Maximum Marks: 100
ContinuousComprehensiveEvaluation(CCE): 40 **UniversityExam (UE): 60**

InternalAssessment	Marks	External Assessment	Marks
Internal Test, Teacher Assessment* (TA) and Class Attendance	40	Term End Exam	60
Total	40		60

Teacher Assessment* Demonstration/Viva-Voce/Lab record etc.

Value Added Course [Constitutional Human and Moral Values (CHM)/Employability and Entrepreneurship Skill Course (EESC)] (2 Credits)

SuggestedContinuousEvaluation Methods:
Maximum Marks: 100

- **CHM: Only Term End Exam (Theory)**
- **EESC: Only Term End Exam (Theory)**