

SYLLABUS

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Class			M.Sc. Forensic Science	
Semester/Year			I Semester	
Subject & Subject Code			Forensic Science - MFOSC20S101	
Paper			Introduction to Forensic Science and Criminal Justice System	
Max. Marks			60(ETE) + 40 (IA) =100	
L	T	P	Credits Total	4
4	0	0		
Course Objectives: This course provides knowledge about <ul style="list-style-type: none">the basic principles of Forensic Science, different branches, functions, nature and scope of Forensic Science.Different roles, Organizational setup and functions of various Government DepartmentsForensic laboratories and Police in Crime Scene investigations.				
Course Outcome: Students will be able to <ul style="list-style-type: none">Understand about the basics and different branches of Forensic Sciences.know about the working and functioning of Forensic science laboratories.Learn the Police science its role in criminal investigation and Prevention of crime.				
Student Learning Outcomes (SLO): After completion of course the students will have knowledge of <ul style="list-style-type: none">The significance of forensic science to human society.The fundamental principles and functions of forensic science.The divisions in a forensic science laboratory.The working of the forensic establishments in India and abroad.				
Unit		Syllabus		Periods
UNIT - I		Forensic Science: <ul style="list-style-type: none">Basic principles and its significance.History & development of forensic science. Nature and scope of forensic science.Organizational structure of Forensic Science Laboratories at central & State level. Ethics in Forensic science.		12 Hrs.

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UNIT - II	Scene of crime: <ul style="list-style-type: none"> Types, protection of scene of crime, preservation (recording) of scene of crime- photography and sketching methods. Physical evidence: <ul style="list-style-type: none"> Meaning, Types, search methods, collection and preservation, Forwarding. Chain of custody. Collection, preservation, packing and forwarding of: blood, semen and other biological stains, firearm exhibits, documents, fingerprint, viscera, hair & fiber, glass, soil and dust, petroleum products, drugs and poisons, etc. 	12 Hrs.
UNIT - III	Crime: <ul style="list-style-type: none"> Definition, theories of causation of crime: Pre-classical and Neo-classical, constitutional, geographical, economic, psychological, sociological, Multiple-causation approach. General factors of crime, forms of punishment in brief. 	12 Hrs.
UNIT - IV	Indian Penal Code: Introduction, General exceptions, Offences against person, Offences against property, Attempt to suicide, Sexual offences. Criminal Procedure Code: Introduction and general idea of sections: 291-93, 154, 155, 156, 157, 158, 159, 160, 161, 162, 172, 173, 174, 175, And 176. Indian Evidence Act: Introduction and general idea of sections: 32, 45, 46, 47, 57, 58, 60, 73, 135, 136, 137, And 159.	12 Hrs.
UNIT - V	Criminal Justice System: Police organization at district, state & central level. Organization of courts in India, jurisdiction of courts in criminal cases, prosecution, F.I.R., case diary. Report Writing and Evidence Evaluation: Report formats of crime scene and laboratory findings. Court Testimony: Admissibility of expert testimony, pro court preparation & court appearance, examination in chief & re-examination, cross examination.	12 Hrs.

Suggested Readings-

1. Saferstein: Criminalistics – An Introduction to Forensic Science, Prentice hall Inc. USA 91995)
2. C.G.G. Aitken and D.A. Stoney; The use of statistics in Forensic Science, Ellis Harwood Limited, England (1991)
3. James, S.H. and Nordby, J.J.; Forensic Science; an Introduction to Scientific and Investigative Techniques, CRC Press, USA (2003)
4. O' Hara & Osterberg: An Introduction to Criminalistics.
5. Forest: Forensic Science, An Introduction.
6. Lee, Honry: Advances in Forensic Science.
7. Sharma J D: VidhivigyanAvemVishVigya.
8. Sharma J D: Apradh ka VigyanikAnveshan.
9. Sharma B R: Forensic Science in Criminal Investigation and trials.
10. Mordby, J Deed Reckoning – The Art of Forensic science Detection, CRC Press LLC, Boca Raton FL, CRC Press (2000)
11. Ram Ahuja: Criminology, Rewal Publ. jabalpur (2000)
12. Indian Penal Code
13. Criminal Procedure Code
14. Indian Evidence Act.

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SYLLABUS

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Class			M.Sc. Forensic Science	
Semester/Year			I Semester	
Subject & Subject Code			Forensic Science - MFOSC20S102	
Paper			Forensic Medicine & Medical Jurisprudence	
Max. Marks			60 (ETE) + 40 (IA) =100	
L	T	P	Credits Total	4
4	0	0		
Course Objectives: <ul style="list-style-type: none">To know the fundamental aspects and scope of medical Jurisprudence, Legal procedure in criminal court.Rules for medico-legal Autopsies.Classification mode manner and causes of death.Types and classification of Injuries. Difference between Ante mortem and Post mortem injuries.				
Course Outcome: <p>After completion of the course, students will know</p> <ul style="list-style-type: none">Rules for medico legal autopsies.Medical evidence and Medical witness.Investigation of Asphyxial death and sexual offences.				
Student Learning Outcomes (SLO): <p>Student will learn</p> <ul style="list-style-type: none">Identification of a personnel with the help of Parameters contributing to personal identityVarious modes of death.The idea about the types of injuries.The importance of autopsy.				
Unit		Syllabus		Periods
UNIT - I		Concept of Medical Jurisprudence: <ul style="list-style-type: none">Brief knowledge about legal procedures in Courts, inquest, Criminal courts and their powers,Subpoena & oath of medical expert.Recording of Medical experts' evidence in courts.Types of Medical evidence. Kinds of witness and rules for giving evidence.		12 Hrs.

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UNIT - II	Personal Identity: <ul style="list-style-type: none"> • Definition and importance. • Parameters contributing to personal identity- Race, Sex, Age, Complexion, features & Photographs, Anthropometry, Fingerprints, Footprints, Tattoo marks, Occupational marks, Handwriting, Clothes & Ornaments, Voice & Speech, DNA, Superimposition techniques for skull. • Disputed paternity. 	12 Hrs.
UNIT - III	Post-Mortem Examination: <ul style="list-style-type: none"> • Importance, post-mortem report format, external & internal examination in brief. • Viscera & its preservation. Examination of decomposed and mutilated bodies. • Precaution to be taken during post mortem examination. • Exhumation. • Cause of death. 	12 Hrs.
UNIT - IV	Injuries- <ul style="list-style-type: none"> • Definition, Classification, Mechanical Injuries (Abrasion, Contusion, Laceration, Fracture and Dislocation of Bone/ Teeth, Incised Wounds, Chop Wound, Stab Wounds and Firearm Wounds), Regional Injuries, Thermal Injuries (Injuries due to Cold and Heat), Chemical Injuries, Miscellaneous Injuries. • Medico-Legal Aspects, Post Mortem & Ante Mortem Wounds, General Characteristics of Injuries from Burns, Scalds, Lightning, Electricity and Radiation. 	12 Hrs.
UNIT - V	Deaths in its Medico-legal aspects: <ul style="list-style-type: none"> • Modes of Death (Coma, Syncope, Asphyxia), Sudden death. • Sign of Death, cessation of vital functions, changes in the Eye & Skin, cooling of body, post-mortem lividity, cadaveric changes in the muscles, putrefaction, adipocere & mummification. • Estimation of time since Death. 	12 Hrs.

Suggested Readings-

1. Modi JS: medical jurisprudence and Toxicology.
2. Taylor: Medical jurisprudence
3. Parikh CK: Chikitsa Nyaya Shastra Aur Vish Vigyan.
4. Keith Simpsen & Bernard Knight: Forensic Medicine
5. Poison, CJ, DJ Gee, B. Knight: Forensic Medicine
6. Reddy: Forensic Medicine.

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SYLLABUS

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Class				M.Sc. Forensic Science
Semester/Year				I Semester
Subject & Subject Code				Forensic Science - MFOSC20S103
Paper				Questioned Documents, Dermatoglyphics and other impressions.
Max. Marks				60 (ETE) + 40 (IA) =100
L	T	P	Credits Total	4
4	0	0		
Course Objectives: Course will Provide Knowledge about <ul style="list-style-type: none">The Principles behind science of Fingerprint, Basic knowledge about types and patterns of Fingerprints and its classification, different physical and chemical methods used to developThe importance of examining questioned documents in crime cases.The tools required for examination of questioned documents.Examination of computer generated, typed and Xeroxed documents.				
Course Outcome: After completion of the course, students will have a sound knowledge of the questioned documents. <ul style="list-style-type: none">The methods for examine the different types of questioned documents.Natural variations in hand writings.Examination of counterfeit Indian currency notes, passports and other mechanical impressions.				
Student Learning Outcomes (SLO): Students will learn <ul style="list-style-type: none">The methods for examine the different types of questioned documents.Natural variations in hand writings.Examination of counterfeit Indian currency notes, passports and other mechanical impressions.The fundamental principles on which the science of fingerprinting is based.The physical and chemical techniques of developing fingerprints on crime scene evidence.The significance of foot, palm, ear and lip prints.				
Unit	Syllabus			Periods
UNIT - I	Documents and Writing Instruments: <ul style="list-style-type: none">Questioned document and their types.Instruments used to prepare documents, ink & its type, physical & chemical examination, paper & its type, manufacturing and examination of paper.Collection, handling, preservation and forwarding of documents seized from scene of crime.			12 Hrs.

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UNIT - II	Examination of Documents: <ul style="list-style-type: none"> Preliminary examination of documents, instruments required for examination. Handwriting- class & individual characteristics, basis of handwriting comparison, making of exemplar, variations in handwriting. Signature, Genuine & forged signatures and their examination. Digital signature. 	12 Hrs.
UNIT - III	Forged & Typed Documents: <ul style="list-style-type: none"> Alteration- Erasure, Addition, Obliteration and Sheet insertion. Secret writing & its decipherment. Charred documents & their decipherment. Indented writing. Typewriting- Class and individual characters & their comparison. Printed matter and their examination. 	12 Hrs.
UNIT - IV	Finger Prints: <ul style="list-style-type: none"> History of finger print, formation of ridges, finger print patterns, ridge characteristics, ridge count, ridge tracing etc. Classification of finger print- primary, secondary, single digit Computerization of finger print and finger print bureau. 	12 Hrs.
UNIT - V	Examination of Finger Prints & Other Impressions: <ul style="list-style-type: none"> Types of fingerprint, latent, visible and plastic prints, location of finger print, development of latent prints by physical and chemical methods. Photography of finger prints. Foot and footwear prints, gait pattern, casting of print on different surfaces and their comparison. Examination of tyre and skid mark on different surfaces and calculation of speed of vehicle. Forensic importance of lip print, bite mark and palm print. 	12 Hrs.

Suggested Readings-

1. Rev. ED.; Ordway Hilton; Scientific Examination I Of Questioned Documents, Elsevier, New York; (1982)
2. Albert S. Osborn; Questioned Documents, Second Ed.; Universal Law Publishing, Delhi; (1998)
3. Albert S. Osborn; The Problem of Proof- Secon Ed.; Universal Law Publishing, Delhi; (1998)
4. Charles C. Thomas, Typewriting Identification I.S.Q.D.; Billy Bates; Springfield, Illinois, USA, (1971)
5. Wilson R. Harrison; Suspect Documents – Their Scientific Examination; Universal Law Publishing, Delhi. (1997)
6. Hard less, H.R.: Disputed Documents, handwriting and thumbs – print identification: profusely illustrated, Low Book Co., Allahabad, (1988)
7. David R. Ashbaugh; Quantitative and Qualitative Friction ridge analysis, CRS Press, (1999)
8. Mehta M. K.; Identification of Thumb Impression & Cross Examination of Finger Prints, N. M. Tripathi (P) Ltd, Bombay (1989)
9. Henry C. Lee & R. E. Ganesslen, Advances in Finger Print Technology, ~RC Press, Boca Raton, London, (1991)

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SYLLABUS

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Class			M.Sc. Forensic Science	
Semester/Year			I Semester	
Subject & Subject Code			Forensic Science - MFOSC20S104	
Paper			Instrumental Methods of Physical Analysis and their Applications	
Max. Marks			60 (ETE) + 40 (IA) =100	
L	T	P	Credits Total	4
4	0	0		
Course Objectives: To Provide knowledge about <ul style="list-style-type: none">• Various instrumental techniques used in Forensic science and importance of chromatographic and spectroscopic techniques in processing crime scene evidence.• Significance of microscopy in visualizing trace evidence and comparing it with control samples,• Fundamental Principles and types of microscope used in forensic science,• The utility of colorimetry, electrophoresis and neutron activation analysis in identifying chemical and biological materials, and principle and significance of Photography, IR, UV photography.				
Course Outcome: From this course students will be able to <ul style="list-style-type: none">• Analysed different evidences using various instrumental methods.• Students will learn the basic principle working and forensic application of spectroscopic techniques.				
Student Learning Outcomes (SLO): Student will learn <ul style="list-style-type: none">• The importance of spectroscopic techniques in processing crime scene evidence.• The utility of neutron activation analysis in identifying chemical and biological materials.• Application of radiochemical techniques in forensic science.• Interpretation of spectra and its forensic application.				
Unit	Syllabus			Periods
UNIT - I	Basic Concept of Spectroscopy: <ul style="list-style-type: none">• General idea on spectroscopy, electromagnetic spectrum, various source of radiation their utility and limitation.• Interaction of radiation with matter i.e., reflection, absorption, fluorescence etc.• Detection of radiation i.e., photographic, photoelectric etc.• Forensic application of spectroscopy.			12 Hrs.

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UNIT - II	Basic Concept of Atomic and Molecular Spectra: <ul style="list-style-type: none"> Atomic spectra – Energy level, quantum number and designation of states, selection rule. Molecular Spectra – Quantitative discussion of molecular bindings, molecular orbital, type of molecular energies, discussion of rotational, vibrational and electronic spectra. 	12 Hrs.
UNIT - III	Ultraviolet-visible and Infrared Spectrophotometry <ul style="list-style-type: none"> Basic principle, instrumentation, qualitative and quantitative analysis, interpretation of spectra etc. Forensic application of UV-Vis. and IR spectrophotometry 	12 Hrs.
UNIT - IV	Atomic Absorption/Emission and X-Ray Spectrometry: <ul style="list-style-type: none"> Basic principle, instrumentation, qualitative and quantitative analysis, Interpretation of spectra and its forensic application. 	12 Hrs.
UNIT - V	Radiochemical Techniques: <ul style="list-style-type: none"> Basic principles and theory, introduction about nuclear reactions and radiations, Neutron sources, Neutron Activation Analysis (NAA), Nuclear Magnetic Resonance Spectroscopy (NMR). Application of radiochemical techniques in forensic science. 	12 Hrs.

Suggested Readings-

1. V.B. Patania; Spectroscopy, Campus Books International, (2004)
2. James W. Robinson; Atomic Spectroscopy, 2nd Edn. Revised & Expanded, marcel Dekkar, Inc, NY. (1996)
3. N. Subrahmanyam & Brij Lal; A text Book of Optics, S. Chand & Co. (2004)
4. Hobart H. Willard, Lynne L. Merrett Jr, John A Dean Frank A. Settle Jr; Instrumental Methods of Analysis, 7th Edn, CBS Pub. & Distributors (1986)
5. K.C. Thompson & R.J. Renolds; Atomic Absorption Fluorescence & Flame Emission Spectroscopy, A Practical Approach, 2nd Edn. Charles Griffin & Co. (178)
6. Robert M. Silverstein & Francis X Webster; Spectrometric Identification of Organic Compounds, 6th Edn., John Wiley & Sons, Inc. (1997)
7. P.S. Kalri; Spectroscopy of Organic Compounds, 4th Edn, New Age International Pub. (2001) w.e.f. 2005-2006
8. D.R. Khanna & H.R. Gulati; Fundamentals of Optics Geometrical Physical & Quantum, 20th Edn., R. Chand & Co. (2002)
9. R.S. Khandpur; handbook of Analytical Instruments, Tata McGraw Hill Pub. Co. New Delhi (2004)

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Class		M.Sc. Forensic Science		
Semester/Year		I Semester		
Subject & Paper Code		Practical Forensic Science - MFOSC20S105		
Paper		Crime Scene Investigation -Practical		
Max. Marks		60 (ETE) + 40 (IA) =100		
L	T	P	Credits Total	2
0	0	2		

PRACTICALS

60 hrs.

1. Basics of crime scene sketching.
2. Sketching of scene of crime.
3. Sketching of outdoor scene of crime (murder, suicide, accident etc)
4. Sketching of indoor scene of crime (theft, dacoity, murder, suicide etc)
5. Photography of scene of crime using manual & digital camera.
6. Methods for searching of physical evidences at scene of crime.
7. Collection, packing, labeling and forwarding of physical evidence from scene of crime to forensic science laboratory.

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Class		M.Sc. Forensic Science		
Semester/Year		I Semester		
Subject & Paper Code		Practical Forensic Science - MFOSC20S106		
Paper		QD, Fingerprint and Other Impressions- Practical		
Max. Marks		100		
L	T	P	Credits Total	2
0	0	2		

PRACTICALS

60 hrs.

1. Examination of various ink samples using planer chromatographic techniques.
2. Decipherment of secret/erased/obliterated/indented writing using physical/chemical method
3. Matching of hand writing and signatures (genuine/forged)
4. Examination of type written and printer generated prints.
5. Print your own 10 digit finger print card using black ink.
6. Primary and secondary classification of given finger print chart.
7. Location, development and lifting of latent finger print.
8. Casting and matching of foot/footwear print on soft surface.
9. Comparison of finger prints.

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Class		M.Sc. Forensic Science		
Semester/Year		I Semester		
Subject & Paper Code		Practical Forensic Science - MFOSC20S105		
Paper		Scene of Crime- Practical		
Max. Marks		60 (ETE) + 40 (IA) =100		
L	T	P	Credits Total	2
0	0	2		

PRACTICALS

60 hrs.

1. Basics of crime scene sketching.
2. Sketching of scene of crime.
3. Sketching of outdoor scene of crime (murder, suicide, accident etc)
4. Sketching of indoor scene of crime (theft, dacoity, murder, suicide etc)
5. Photography of scene of crime using manual & digital camera.
6. Methods for searching of physical evidences at scene of crime.
7. Collection, packing, labeling and forwarding of physical evidence from scene of crime to forensic science laboratory.

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Class		M.Sc. Forensic Science		
Semester/Year		I Semester		
Subject & Paper Code		Practical Forensic Science - MFOSC20S106		
Paper		Questioned Documents, and Finger prints Practical		
Max. Marks		100		
L	T	P	Credits Total	2
0	0	2		

PRACTICALS

60 hrs.

1. Examination of various ink samples using planer chromatographic techniques.
2. Decipherment of secret/erased/obliterated/indented writing using physical/chemical method
3. Matching of hand writing and signatures (genuine/forged)
4. Examination of type written and printer generated prints.
5. Print your own 10 digit finger print card using black ink.
6. Primary and secondary classification of given finger print chart.
7. Location, development and lifting of latent finger print.
8. Casting and matching of foot/footwear print on soft surface.
9. Comparison of finger prints.

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Abdullah

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Megha

Jahnvi

Shweta

Dr