

<b>1. Name of the Department: Forensic Sciences</b>						
<b>2. Course Name</b>	<b>INTRODUCTION TO CRIMINAL JUSTICE, LAW AND SOCIETY</b>	<b>L</b>	<b>T</b>	<b>P</b>		
<b>3. Course Code</b>	17110101	2	0	0		
<b>4. Type of Course (use tick mark)</b>	<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>	
<b>5. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (☐)	Either Sem ()	Every Sem ()
<b>7. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>8. Course Description:</b>						
This core paper in Forensic Sciences, the student will be able to know about the basic knowledge of Criminology and Scope of forensic science. Understanding modus operandi. Investigative strategy. Police's power of investigation. Filing of criminal charges.						
<b>9. Course Outcomes (COs):</b>						
Upon successful completion of this course, the student will be able to: CO-1: Know about the basics and history of Forensic science and the organizational set up of Forensic science laboratories. CO-2: Describe mandate, set-up of and report writing of Forensic Science in accordance with Indian justice system. CO-3: Make use of various IPC, CrPC, and IEA sections. CO-4: Apply knowledge in solving crimes related to IT Act, NDPS Act, Drugs & Cosmetics Act, Dowry Prohibition act, Explosive Substances Act and Wild Life Protection Act.						
<b>10. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures =</b>	<b>Title of the unit: Society</b>				
Meaning and Concept of society, culture, informal means of social control (norms, mores, folkways, taboos), social deviance, groups, community, social organization and disorganization, social structure and process – Crime and criminology definitions – Historical development – Nature, origin and scope – Criminology and its relationship to other disciplines – Social construction of deviance and crime – Definition of victims of crime and victims of abuse of power.						
<b>Unit – 2</b>	<b>Number of lectures =</b>	<b>Title of the unit: Typology of Crime</b>				
Crime against person, Crime against property, White collar crime, Organized crime, Cybercrime, Environmental crime.  Crime and media, Habitual offenders, Professional criminals, Violent offences, Recidivism.						
<b>Unit – 3</b>	<b>Number of lectures</b>	<b>Title of the unit: Juvenile Delinquency</b>				

	=	
Definition: Nature and patterns of delinquency, Causes, Salient features of the Juvenile Justice board and Act (Care and Protection of Children) (amended) Act, 2006.		
<b>Unit – 4</b>	<b>Number of lectures</b> =	<b>Title of the unit: Criminal Justice System</b>
Introduction to criminal justice in India, Police, Prosecution, Judiciary, Correctional departments, Co-operation and co-ordination among the various sub-systems of the Criminal Justice System. Social Defence and Related Concepts Concept of Social Defence, Drug abuse: Alcoholism, Child abuse.		
<b>11. Brief Description of self learning / E-learning component</b>		
<a href="https://www.youtube.com/watch?v=sv96E5Hbgf8">https://www.youtube.com/watch?v=sv96E5Hbgf8</a> <a href="https://www.youtube.com/watch?v=I3i19qRjSSg">https://www.youtube.com/watch?v=I3i19qRjSSg</a> <a href="https://www.youtube.com/watch?v=nNvy7_73ecc">https://www.youtube.com/watch?v=nNvy7_73ecc</a> <a href="https://www.youtube.com/watch?v=MV4DAuR1O1M">https://www.youtube.com/watch?v=MV4DAuR1O1M</a> <a href="https://epgp.inflibnet.ac.in/ahl.php?csrno=16">https://epgp.inflibnet.ac.in/ahl.php?csrno=16</a> <a href="https://drive.google.com/file/d/122C9NaIYt5xamwKhiUa2X_tJCvR3x6vE/view">https://drive.google.com/file/d/122C9NaIYt5xamwKhiUa2X_tJCvR3x6vE/view</a> <a href="https://drive.google.com/file/d/1MY557S0fZc1Mv2GXxAY4CFi0m5Wr03gG/view">https://drive.google.com/file/d/1MY557S0fZc1Mv2GXxAY4CFi0m5Wr03gG/view</a> <a href="http://www.forensicpage.com/new10.htm">http://www.forensicpage.com/new10.htm</a> <a href="https://www.futurelearn.com/courses/introduction-to-forensic-science">https://www.futurelearn.com/courses/introduction-to-forensic-science</a>		
<b>12. Books Recommended</b>		
<ol style="list-style-type: none"> <li>1. Chockalingam, K. (1997). 'Kuttraviyal' (Criminology) in Tamil. Chennai: Parvathi Publications.</li> <li>2. Crime in India. (2002). National Crime Records Bureau. New Delhi: Ministry of Home Affairs, Govt. of India.</li> <li>3. Paranjepe, N.V. (2002). Criminology and Penology. Allahabad: Central Law Publications.</li> <li>4. Sutherland, E.H., &amp; Cressey, D.R. (1974). Principles of Criminology. Philadelphia: Lippincott.</li> <li>5. Vold, G., &amp; Bernard, Thomas J. (1986). New Horizons in Criminology. New Delhi : Prentice Hall.</li> </ol>		

<b>1. Name of the Department: Forensic Sciences</b>						
<b>2. Course Name</b>	<b>INSTRUMENTATION</b>			<b>L</b>	<b>T</b>	<b>P</b>
<b>3. Course Code</b>	17110102			2	0	0
<b>4. Type of Course (use tick mark)</b>		<b>Core</b> ( <input type="checkbox"/> )	<b>DSE</b> ()	<b>AEC</b> ()	<b>SEC</b> ()	<b>OE</b> ()
<b>5. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ( <input type="checkbox"/> )	Odd ()	Either Sem ()	Every Sem ()
<b>7. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>8. Course Description:</b>						
This core paper in Forensic Sciences, help to understand the Fundamentals of Spectroscopy, Spectroscopy Techniques, Absorption of radiations, Spectrophotometers, UV-Visible spectroscopy, Forensic applications, Basics of Fluorescence, Phosphorescence and Chemiluminescence spectrometry.						
<b>9. Course Outcomes (COs):</b>						
Upon successful completion of this course, the student will be able to: <b>CO-1:</b> Define the Fundamentals of spectroscopy. <b>CO-2:</b> Understand principle and instrumentation of different spectroscopic techniques. <b>CO-3:</b> Know the Forensic application of spectroscopic techniques						
<b>10. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures</b> =	<b>Title of the unit: Spectroscopic analysis</b>				
Definition and Fundamentals of Spectroscopy, Light and Energy, Electromagnetic Radiations, Wavelength and Frequency, Spectroscopy Techniques, Absorption of radiations, Spectrophotometers.						
<b>Unit – 2</b>	<b>Number of lectures</b> =	<b>Title of the unit: Ultraviolet and Visible-visible (UV-Vis) Molecular Spectroscopy</b>				
Introduction, Review of UV-Visible spectroscopy-Fundamental laws of spectrophotometry, Deviation from Beer's Law, Instrumentation and techniques, qualitative and quantitative methods in UV-Visible spectroscopy, Forensic applications, Basics of Fluorescence, Phosphorescence and Chemiluminescence spectrometry.						
<b>Unit – 3</b>	<b>Number of lectures</b> =	<b>Title of the unit: Infrared Spectroscopy</b>				
Introduction, Review of IR spectroscopy, Dispersive and Non-dispersive IR spectrophotometers, Fourier Transform Infrared Spectroscopy, Instrumentation and Techniques, Interpretation of IR spectra and Forensic applications. Analytical Protocols: Sample preparation and interpretation of spectra, Forensic applications. Nuclear Magnetic Resonance (NMR): Basic Principle, Properties of Nuclei, Width of Absorption Lines,						

Chemical shifts, Spin-spin coupling, Instrumentation and Forensic applications.		
<b>Unit – 4</b>	<b>Number of lectures</b> =	<b>Title of the unit: Other Techniques</b>
Introduction, Basic principles, Theory, Instrumentation and Techniques, FAAS and GFAAS, Interference in AAS-Background correction methods, Forensic applications in chemical analysis. <b>Raman spectroscopy:</b> Instrumentation, sample handling and illumination, structural analysis, polarization measurements and Dispersive & FT analysis. <b>X-ray spectroscopy:</b> X-ray absorption and fluorescence methods, X-ray diffraction, Auger emission spectroscopy (AES), and electron spectroscopy for chemical analysis (ESCA), <b>Neutron Activation Analysis:</b> Radioactive Isotope, Principles, Theory, Instrumentation- Various Neutron Sources, Detection and Measurement of Gamma-Rays for Qualitative And Quantitative Analysis.		
<b>11. Brief Description of self learning / E-learning component</b>		
<ol style="list-style-type: none"> <li>1. <a href="https://www.sciencedirect.com/topics/neuroscience/atomic-absorption-spectroscopy">https://www.sciencedirect.com/topics/neuroscience/atomic-absorption-spectroscopy</a></li> <li>2. <a href="http://www.microspectra.com/component/content/article/52-craictech/292-raman-spectroscopy">http://www.microspectra.com/component/content/article/52-craictech/292-raman-spectroscopy</a></li> <li>3. <a href="https://www.livescience.com/64241-x-ray-spectroscopy.html">https://www.livescience.com/64241-x-ray-spectroscopy.html</a></li> </ol>		
<b>12. Books Recommended</b>		
<ol style="list-style-type: none"> <li>1. Borrow (1980) Molecular Spectroscopy.</li> <li>2. Willdard, H. H (1974) Instrumental Methods of Analysis.</li> <li>3. Moonesens A.A. (1979) Scientific Evidence in Criminal Cases.</li> <li>4. Lundquist &amp; Curry (1963) Methods of Forensic Science.</li> <li>5. Settle,F.A.(1997) Handbook of Instrumental Techniques for Analytical Chemistry, Prentice Hall.</li> <li>6. E. Stahl (1969) Thin Layer Chromatography: A Laboratory Handbook.</li> <li>7. Sue Jickells and Adam Negrusz (2008) Clarke’s Analytical Forensic Toxicology.</li> <li>8. Forensic Chemistry: Max M Houck (2015)</li> </ol>		

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	General Forensic Sciences		<b>L</b>	<b>T</b>	<b>P</b>	
<b>03. Course Code</b>	17100103		2	0	0	
<b>04. Type of Course (use tick mark)</b>		<b>Core ()</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (*)	Either Sem ()	Every Sem ()
<b>06. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures = 28</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to –						
<b>CO1:</b> Know the significance of forensic science to human society.						
<b>CO2:</b> Understand the fundamental principles and functions of forensic science.						
<b>CO3:</b> Understand the working of the forensic establishments in India and abroad.						
<b>10. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures = 7</b>	Title of the unit: Functions of Forensic Science				
Functions of Forensic Science, Definitions and concepts in forensic science. Scope of forensic science. Need of forensic science. Basic principles of forensic science.						
Tools and techniques in forensic science. Branches of forensic science. Data depiction. Report writing. Expert witness. Presentation of evidence and evidentiary clues.						
<b>Unit – 2</b>	<b>Number of lectures = 7</b>	Title of the unit: Forensic Science In India				
Forensic science in India: Organizational set up of forensic science laboratories. Administration and Organizational Setup: DFSS, CFSL, GEQD, SFSL, RFSL, MFSL, FPB, NICFS, CDTs, NCRB, BPR&D, Qualifications and duties of Forensic Scientists Academic centres of education and research: Indian and Academy of Forensic Science, American Board of Forensic Science, American Board of Forensic Odontology, Bureau of Alcohol Tobacco and Firearms, Interpol and FBI, Australian Academy of Forensic Sciences.						
<b>Unit – 3</b>	<b>Number of lectures = 7</b>	Title of the unit: Expert testimony and Acts				
Forensic Expert: Definition and related Laws & Issues, Evidence in Enquiries and Trials, Expert Witness (CrPC. 291-93), Indian Evidence Act - Section 32, 45, 46, 47, 57, 58, 60, 73, 135, 136, 137, 138, 141. Briefs of Information Technology IT Act, Narcotic Drugs & Psychotropic Substances Act, Drugs & Cosmetics Act, Explosive Substances Act, Dowry Prohibition Act, Prevention of Corruption Act, Arms Act, Wild Life Protection Act, IT. Act.						

<b>Unit – 4</b>	<b>Number of lectures = 7</b>	<b>Title of the unit: Introduction of offences and Penalties</b>
Offences against the person-Sections: 299, 300, 302, 304B, 307, 309, 319, 320, 324, 326, 351, 354, 359, 362, 375 and 377. Offences against property- Sections:-378, 383, 390, 391, 405, 415, 420, 441, 463, 489A, 497, 499, 503 and 511.489A, 497, 499, 503 and 511.		
<b>11. Brief Description of self learning / E-learning component</b>		
<ol style="list-style-type: none"> <li>1. <a href="https://epgp.inflibnet.ac.in/ahl.php?csrno=16">https://epgp.inflibnet.ac.in/ahl.php?csrno=16</a></li> <li>2. <a href="https://drive.google.com/file/d/122C9NaIYt5xamwKhiUa2X_tJCvR3x6vE/view">https://drive.google.com/file/d/122C9NaIYt5xamwKhiUa2X_tJCvR3x6vE/view</a></li> <li>3. <a href="http://www.forensicpage.com/new10.htm">http://www.forensicpage.com/new10.htm</a></li> </ol>		
<b>12. Books Recommended</b>		
<ol style="list-style-type: none"> <li>1. Houck, M.M. &amp; Siegel, JA; Fundamentals of Forensic Science, Academic Press, London, 2006.</li> <li>2. Sharma, B.R., Forensic Science in Criminal Investigation &amp; Trials, Universal Publishing Co., New Delhi, 2003.</li> <li>3. Nanda B.B and Tewari, R.k. Forensic Science in India- A vision for the Twenty First Century, Select publisher, N. Delhi, 2001.</li> <li>4. James, SH and Nordby, J.J., Forensic Science- An Introduction to Scientific and investigative Techniques, CRC Press, USA (2003)</li> <li>5. Saferstein; Criminalistics- An Introduction of Forensic Science, Prentice Hall Inc, USA,2007.</li> <li>6. Sharma, B.R. (1974) Forensic Science in Criminal Investigation and Trials, Central Law Agency, Allahabad, 1974.</li> </ol>		

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>Practical –II</b>			<b>L</b>	<b>T</b>	<b>P</b>
<b>03. Course Code</b>	<b>17110104</b>			0	0	4
<b>04. Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (☐)	Either Sem ()	Every Sem ()
<b>06. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures = Nil</b>		<b>Tutorials = Nil</b>		<b>Practical = 09</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to –						
<b>CO 1:</b> Identify and describe different types of bones and their measurements.						
<b>10. Unit wise detailed content</b>						
<b>Practicals</b>						
<ol style="list-style-type: none"> <li>1. To determine age and race from skull and teeth.</li> <li>2. To determine sex from skull.</li> <li>3. To determine sex from pelvis.</li> <li>4. To study identification and description of bones and their measurements.</li> </ol>						

**PAPER V (17110105) - SEMINAR AND ASSIGNMENTS**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>Assignments &amp; Seminars</b>		<b>L</b>	<b>T</b>	<b>P</b>	
<b>03. Course Code</b>	<b>17110105</b>		0	2		0
<b>04. Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (☐)	Either Sem ()	Every Sem ()
<b>06. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = 02</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to –						
<b>CO1:</b> Enhance the Communication skills and thorough knowledge on particular topics. <b>CO2:</b> Work and preparation on Assignments based on case studies.						



**SEMESTER-II**

**SPECIALIZATION (FORENSIC BIOLOGY, SEROLOGY AND DNA PROFILING)**

**PAPER-I**

<b>01. Name of the Department: Forensic Sciences</b>					
<b>02. Course Name</b>	<b>FORENSIC BIOLOGY AND SEROLOGY</b>	<b>L</b>	<b>T</b>	<b>P</b>	
<b>03. Course Code</b>	<b>17110201</b>	2	0	0	
<b>04. Type of Course (use tick mark)</b>	<b>Core (<input type="checkbox"/>)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd ( <input type="checkbox"/> )	Either Sem () Every Sem ()
<b>07. Total Number of Lectures, Tutorials, Practicals</b>					
<b>Lectures =</b>	<b>Tutorials = Nil</b>	<b>Practical = Nil</b>			
<b>08. Course Description:</b>					
<p>This core paper in Forensic Sciences, help to understand the Importance, nature, location, collection and evaluation of biological evidence. Hair examination. Collection and preservation of hair evidence. Identification from hair. Forensic significance of semen, saliva, sweat, milk and urine. Significance of wildlife forensic. Protected and endangered species of animals and plants. Illegal trading in wildlife items, such as skin, fur, bone, horn, teeth and Insects of forensic importance.</p>					
<b>09. Course Outcomes (COs):</b>					
<p>Upon successful completion of this course, the student will be able to:  <b>CO-1:</b> Understand the importance of biological fluids (blood, semen, saliva and other body fluids) in crime investigations.  <b>CO-2:</b> Understand the scientific basis of DNA typing.  <b>CO-3:</b> Students would be able to understand the importance, nature, collection and preservation of Hair evidence.  <b>CO-4:</b> Understand the significance of wildlife and the crucial role they can play in providing justice to wildlife.  <b>CO-5:</b> The methods used to arrive at post-mortem interval, manner of death and sometimes the cause of death by using entomological evidence.</p>					
<b>10. Unit wise detailed content</b>					
<b>Unit-1</b>	<b>Number of lectures =</b>	<b>Title of the unit: Biological evidence.</b>			
<p>Biological evidence. Importance, nature, location, collection and evaluation of biological evidence. Hair examination. Structure of hair. Growth and replacement of hair. Collection and preservation of hair evidence. Identification from hair.</p>					
<b>Unit – 2</b>	<b>Number of lectures =</b>	<b>Title of the unit: Blood and blood groups</b>			

Blood and blood groups. Forensic characterization of bloodstains. Bloodstain patterns. Forensic significance of semen, saliva, sweat, milk and urine. Scientific basis of DNA typing. Collection of DNA evidence. Applications of DNA typing in criminal and civil cases.		
<b>Unit – 3</b>	<b>Number of lectures =</b>	<b>Title of the unit: Wildlife Forensic</b>
Wildlife Forensic. Significance of wildlife forensic. Protected and endangered species of animals and plants. Illegal trading in wildlife items, such as skin, fur, bone, horn, teeth, flowers and plants. Traditional Chinese Medicine. Identification of physical evidence pertaining to wildlife forensics.		
<b>Unit – 4</b>	<b>Number of lectures =</b>	<b>Title of the unit: Forensic entomology</b>
Forensic entomology. Insects of forensic importance. Collection of entomological evidence during death investigations.		
<b>11. Brief Description of self learning / E-learning component</b>		
<ol style="list-style-type: none"> <li>1. <a href="https://www.youtube.com/watch?v=MZTDjix4_Zw">https://www.youtube.com/watch?v=MZTDjix4_Zw</a></li> <li>2. <a href="https://www.youtube.com/watch?v=MZTDjix4_Zw">https://www.youtube.com/watch?v=MZTDjix4_Zw</a></li> <li>3. <a href="https://www.youtube.com/watch?v=CNqGkYsTufo">https://www.youtube.com/watch?v=CNqGkYsTufo</a></li> <li>4. <a href="https://www.youtube.com/watch?v=ZaRyoVyGs14">https://www.youtube.com/watch?v=ZaRyoVyGs14</a></li> <li>5. <a href="https://www.youtube.com/watch?v=taSCtCKVyRs">https://www.youtube.com/watch?v=taSCtCKVyRs</a></li> <li>6. <a href="https://www.youtube.com/watch?v=efPx0avVh5w">https://www.youtube.com/watch?v=efPx0avVh5w</a></li> <li>7. <a href="https://www.youtube.com/watch?v=Xe3aCEznmWA">https://www.youtube.com/watch?v=Xe3aCEznmWA</a></li> <li>8. <a href="https://www.youtube.com/watch?v=YOjDr0IT48w">https://www.youtube.com/watch?v=YOjDr0IT48w</a></li> <li>9. <a href="http://www.bloodspatter.com/bloodstain-tutorial">http://www.bloodspatter.com/bloodstain-tutorial</a></li> <li>10. <a href="https://epgp.inflibnet.ac.in/ahl.php?csrno=16">https://epgp.inflibnet.ac.in/ahl.php?csrno=16</a></li> </ol>		
<b>12. Books Recommended</b>		
<ol style="list-style-type: none"> <li>1. Robertson, J. (1996): Forensic Examination of Hair. Taylor and Francis, USA.</li> <li>2. Modi, J.K. (1988): Medical Jurisprudence and Toxicology, N.M. Tripathi Pvt. Ltd.</li> <li>3. Fraser, Roberts J.A (1965): An introduction to Medical Genetics.</li> <li>4. Chatterjee, C. C- (1975): Human Physiology.</li> <li>5. Boorman, K. E: Blood Group Serology, Churchill, and Lincoln, P. J. (1988)</li> <li>6. Race, R. R. and Sangar, R. (1975): Blood Groups in Man. Blackwell Scientific, Oxford.</li> <li>7. Saferstein, R. (1982): Science Handbook, Vol. I, II and III, Prentice Hall, New Jersey.</li> <li>8. Barris, H. and Hopkinson, D. A. (1976): Handbook of Enzyme, Electrophoresis, Elsevier, North, Holland, New York.</li> </ol>		

<b>PAPER-II</b>						
<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>FORENSIC ANTHROPOLOGY AND ODONTOLOGY</b>	<b>L</b>	<b>T</b>	<b>P</b>		
<b>03. Course Code</b>	<b>17110202</b>	2	0	0		
<b>04. Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (☐)	Either Sem ()	Every Sem ()
<b>07. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>08. Course Description:</b>						
This core paper in Forensic Sciences, help to understand Definition and Scope within the medical-legal context of personal identification of human remains as in cases of homicides or mass disasters, Brief introduction to Forensic Archeology and Anthropometry.						
<b>09. Course Outcomes (COs):</b>						
Upon successful completion of this course, the student will be able to: <b>CO1:</b> Classify bones and major anatomical features of the human skeleton. <b>CO2:</b> Employ metric and non-metric techniques for determining sex, age, ancestry, and stature.						
<b>10. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures =</b>	<b>Title of the unit: Forensic Physical Anthropology</b>				
Definition and Scope within the medical-legal context of personal identification of human remains as in cases of homicides or mass disasters, Brief introduction to Forensic Archeology and Anthropometry. Human skeletal system: Nature and formation of bones, introduction to Human skeleton, Classification of human bones. Comparative anatomy of skeletal systems/bones of some forensically important animals.						
<b>Unit – 2</b>	<b>Number of lectures =</b>	<b>Title of the unit: Determination of Age</b>				
Determination of Age from skull and other bones. Sexual dimorphism from skeletal bones. Determination of Race and estimation of stature from skeletal remains.						
<b>Unit – 3</b>	<b>Number of lectures =</b>	<b>Title of the unit: Personal Identification</b>				
Portrait Parle/Bertillon system, Somatoscopy and Somatometry. Forensic Facial Reconstruction: Two Dimensional and 3 Dimensional Methods, Importance of tissue depth to reconstruct various facial features.						

Unit – 4	Number of lectures =	Title of the unit: Forensic Odontology
Development and scope, role in mass disaster and anthropology, structural variation in teeth (human and non-human), types of teeth and their functions, Determination of age from teeth: Eruption sequence, Gustafson's method. Dental anomalies, their significance in personal identification. Bite marks: Forensic significance, collection and preservation of bite marks, photography of bite marks, and evaluation of bite marks, Legal aspects.		
<b>11. Brief Description of self learning / E-learning component</b>		
<ol style="list-style-type: none"> <li>1. <a href="https://www.britannica.com/science/forensic-anthropology">https://www.britannica.com/science/forensic-anthropology</a></li> <li>2. <a href="http://www.srmuniv.ac.in/sites/default/files/files/Forensic.pdf">http://www.srmuniv.ac.in/sites/default/files/files/Forensic.pdf</a></li> <li>3. <a href="https://www.researchgate.net/publication/263732838_Personal_Identification_in_Forensic_Examinations">https://www.researchgate.net/publication/263732838_Personal_Identification_in_Forensic_Examinations</a></li> </ol>		
<b>12. Books Recommended</b>		
<ol style="list-style-type: none"> <li>1. Forensic Dentistry (1999) Paul G. Stimson, Curtis A. Mertz; CRC Press, LLC.</li> <li>2. Craniofacial Identification in forensic Medicine, edited by John. G Clement and David. L. Ranso; Oxiford University, Press; 1998.</li> <li>3. Beals, R.L. and Hozier, H. (1985): An Introduction to Anthropology, Macmillan, New Delhi.</li> <li>4. Krogman, W.M. And Iscan, M. (1987): Human Skeleton in Forensic Medicine, Charles &amp; Thomas, U.S.A.</li> <li>5. Gray's Anatomy (1987): Churchill Livingstone, Edinburgh.</li> <li>6. Modi, J.K. (1988): Medical Jurisprudence &amp; Toxicology, N.M. Tripathi Pvt. Ltd.</li> <li>7. Taylor (2000) : Forensic Art and Illustrations CRC Press.</li> <li>8. Singh, I.P. and Bhasin M. K. (1968): Anthropometry, Kamla-Raj Publications, Delhi.</li> <li>9. Beals, R.L. and Hoizer, H. (1985): An introduction to Anthropology, Macmillan, New Delhi.</li> <li>10. Alan Gunn (2009) Essential Forensic Biology, 2nd Edition</li> </ol>		

**PAPER-III**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>FORENSIC DNA PROFILING</b>			<b>L</b>	<b>T</b>	<b>P</b>
<b>03. Course Code</b>	<b>17110203</b>			2	0	0
<b>04. Type of Course (use tick mark)</b>	<b>Core</b> ( <input type="checkbox"/> )	<b>DSE</b> ()	<b>AEC</b> ()	<b>SEC</b> ()	<b>OE</b> ()	
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd ( <input type="checkbox"/> )	Either Sem ()	Every Sem ()
<b>07. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>Course description:</b>						
This core paper in Forensic Sciences, help to understand the Importance, nature, location, collection and evaluation of biological evidence. Scientific basis of DNA typing. Collection of DNA evidence. Applications of DNA typing in criminal and civil cases						
<b>08. Course Outcomes (COs):</b>						
Upon the completion of this course students would be able to :- <b>CO-1:</b> Understand the basic concepts of human genetics. <b>CO-2:</b> Understand the usefulness of genetic markers in forensic investigation along with the interpretation of a DNA profile. <b>CO-3:</b> Understand the need, progress, forensic significance and the legal importance of DNA profiling in various scenarios in India and abroad. <b>CO-4:</b> Understand the potential Benefits of DNA Data banking. <b>CO-5:</b> Use DNA statistics for calculations in different types of cases encountered in Forensic Science.						
<b>9. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures =</b>	<b>Title of the unit: Human Genetics</b>				
Heredity, Alleles, Mutations and Population Genetics, The concept of Genetics, polymorphism, Hardy-Weinberg Law.						
<b>Unit – 2</b>	<b>Number of lectures =</b>	<b>Title of the unit: DNA Profiling</b>				
Introduction, History of DNA Typing, molecular biology of DNA, variations, polymorphism, DNA Extraction- Organic and Inorganic extraction, Comparison of Extraction methods, Commercial kits DNA typing systems- RFLP analysis, PCR amplifications, sequence polymorphism. Analysis of SNP, YSTR, Mitochondrial DNA, Ancient DNA typing, Evaluation of results.						
<b>Unit – 3</b>	<b>Number of lectures =</b>	<b>Title of the unit: DNA Statistics</b>				
Frequency estimate calculations, interpretations, allele frequency determination, Paternity/Maternity index, Sibling index, Probability of match. Human Genome Project: Introduction, History, Goals, Benefits, Social, Ethical and Legal Issues DNA Forensic Databases, Ethical, Legal, and Social Issues Associated with DNA						

Databanking, Potential Benefits of DNA Data banking Quality control, certification and accreditation.		
<b>Unit – 4</b>	<b>Number of lectures =</b>	<b>Title of the unit: Forensic Significance of DNA profiling</b>
Applications in disputed paternity cases, child swapping, missing person's identity- civil immigration, veterinary, wildlife and agriculture cases, legal perspectives- legal standards for admissibility of DNA profiling, procedural and ethical concerns, status of development of DNA profiling in India and abroad. New and future technologies: DNA chips, SNPs and limitations of DNA profiling.		
<b>10. Brief Description of self learning / E-learning component</b>		
<ol style="list-style-type: none"> <li>1. <a href="https://www.youtube.com/watch?v=kF6EGa8GpD0">https://www.youtube.com/watch?v=kF6EGa8GpD0</a></li> <li>2. <a href="https://www.youtube.com/watch?v=CNqGkYsTufo">https://www.youtube.com/watch?v=CNqGkYsTufo</a></li> <li>3. <a href="https://www.youtube.com/watch?v=G7NnlySIEk">https://www.youtube.com/watch?v=G7NnlySIEk</a></li> <li>4. <a href="https://www.youtube.com/watch?v=iARKkEpsdjc">https://www.youtube.com/watch?v=iARKkEpsdjc</a></li> <li>5. <a href="https://www.youtube.com/watch?v=RZh0R1OscOc">https://www.youtube.com/watch?v=RZh0R1OscOc</a></li> </ol>		
<b>11. Books Recommended</b>		
<ol style="list-style-type: none"> <li>1. Saferstein, R. (1982) Science Handbook, Vol. I, II, &amp; III, Prentice Hall New Jersey.</li> <li>2. Kirby : DNA Fingerprinting Technology.</li> <li>3. DNA structure and functions by Richard R. Sinden; Academic Press, Inc. 1994.</li> <li>4. DNA Profiling and DNA fingerprinting (1999) Edited by Jorg T. Epplen and Thomas Lubjuhn; BirkhauserVerlag, Switzerland.</li> <li>5. Forensic DNA Profiling Protocols (1998) Patrick J. Lincoln and Jim Thomson; Humana Press, Inc.</li> <li>6. DNA and other Polymorphism in Forensic Science (1990) Henry C. Lee and R.E. Gaensslen; Year book Medical Publishers, Inc.</li> <li>7. Keith In man and Norah Rudin (1997) An Introduction to Forensic DNA Analysis, CRC Press; Ny.</li> <li>8. Koblinsky et al. (2005) DNA -Forensic and Legal Implications.</li> <li>9. John M. Butler (2005) Forensic DNA Typing: Biology, Technology, and Genetics of STR Markers Academic Press.</li> </ol>		

**PAPER IV (17110204) – PRACTICALS**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>Practical-II</b>		<b>L</b>	<b>T</b>	<b>P</b>	
<b>03. Course Code</b>	<b>17110204</b>		<b>0</b>	<b>0</b>	<b>10</b>	
<b>04. Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ( )</b>	<b>AEC ( )</b>	<b>SEC ( )</b>	<b>OE ( )</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	<b>Even ( )</b>	<b>Odd (☐)</b>	<b>Either Sem ( )</b>	<b>Every Sem ( )</b>
<b>06. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures = Nil</b>		<b>Tutorials = Nil</b>		<b>Practical = 10</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to –						
<b>CO1:</b> Prepare slides of scale patterns of human hair. <b>CO2:</b> Examine Barr bodies from hair root. <b>CO3:</b> Determine blood group from stains of blood and various body fluids. <b>CO4:</b> Study the life cycle of blowfly.						
<b>Practicals:</b>						
<ol style="list-style-type: none"> <li>1. To prepare slides of scale patterns of human hair.</li> <li>2. To examine human hair for cortex and medulla.</li> <li>3. To examine Barr bodies from hair root.</li> <li>4. To determine blood group from fresh blood and blood stains.</li> <li>5. To identify blood stains.</li> <li>6. To identify semen stains.</li> <li>7. To identify saliva stains.</li> <li>8. To determine blood group from stains of blood and various body fluids with Absorption-inhibition, mixed agglutination and absorption-elution technique</li> <li>9. To study the life cycle of blowfly.</li> <li>10. To study the different microbes.</li> </ol>						
<b>11. Brief Description of self learning / E-learning component</b>						
<b>12. Books Recommended</b>						
<ol style="list-style-type: none"> <li>1. DFS Manuals of Forensic Science</li> </ol>						

**PAPER V (17110205) - SEMINAR AND ASSIGNMENTS**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>Assignments &amp; Seminars</b>		<b>L</b>	<b>T</b>	<b>P</b>	
<b>03. Course Code</b>	<b>17110205</b>		0	2		0
<b>04. Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (☐)	Either Sem ()	Every Sem ()
<b>06. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = 02</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to –						
<b>CO1:</b> Enhance the Communication skills and thorough knowledge on particular topics. <b>CO2:</b> Work and preparation on Assignments based on case studies.						



**SPECIALIZATION (FINGERPRINTS AND FOOT PRINTS)**

**PAPER-I**

<b>01. Name of the Department:</b> Forensic Sciences					
<b>02. Course Name</b>	Footprints and other Impressions	<b>L</b>	<b>T</b>	<b>P</b>	
<b>03. Course Code</b>	<b>17100102</b>	2	0	0	
<b>04. Type of Course (use tick mark)</b>	<b>Core ()</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (*)	Either Sem () Every Sem ()
<b>06. Total Number of Lectures, Tutorials, Practicals</b>					
<b>Lectures = 28</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>	
<b>08. Course Outcomes (COs):</b>					
The students will able to –					
<b>CO1:</b> Different instrumental techniques that use in fingerprint examinations.					
<b>CO2:</b> Understand the Individual identification from fingerprint and they can use in the crime investigation.					
<b>CO3:</b> Know the Significance of foot, palm, ear and lip prints.					
<b>CO4:</b> Develop latent fingerprints on crime scene.					
<b>10. Unit wise detailed content</b>					
<b>Unit-1</b>	<b>Number of lectures = 7</b>	<b>Title of the unit: Basics of Fingerprints</b>			
History and development of Dermatoglyphics, formation of ridges, Composition of sweat, pattern types, pattern area. Classification of fingerprints- Henry's system of classification, single-digit classification, Extension of Henry's classification, filing, searching and fingerprint bureau. Automated Fingerprint Identification System. Significance of poroscopy and edgeoscopy.					
<b>Unit – 2</b>	<b>Number of lectures = 7</b>	<b>Title of the unit: Techniques in developing Fingerprints.</b>			
Development of chance, latent, visible and plastic prints. Conventional methods of development of latent prints- fluorescent methods, magnetic powder method, fuming method, chemical method etc. Application of laser and other radiations to develop latent fingerprints, metal deposition method and development of latent prints on skin.					
<b>Unit – 3</b>	<b>Number of lectures = 7</b>	<b>Title of the unit: Other Impressions</b>			
Importance of Gait pattern, footprints and Shoeprints importance, Tyre marks, skid marks, tread marks, Tool marks & its types.					
Palm prints & Lip prints - Nature, location, collection and examination of lip prints. Ear prints and their significance. Palm prints and their historical importance.					

<b>Unit – 4</b>	<b>Number of lectures = 7</b>	<b>Title of the unit: Methods of Restoration of Impressions</b>
Chemical Methods and techniques for collection and Restoration of Engine chassis Numbers, tracing, tyre marks. Casting of Footprints, Shoeprints and Tool marks and their importance in crime scene investigations.		
<b>11. Brief Description of self learning / E-learning component</b>		
<ol style="list-style-type: none"> <li>1. <a href="http://www.analyst.gov.lk/web/index.php?option=com_content&amp;view=article&amp;id=52&amp;Itemid=60&amp;lang=en">http://www.analyst.gov.lk/web/index.php?option=com_content&amp;view=article&amp;id=52&amp;Itemid=60&amp;lang=en</a></li> <li>2. <a href="http://grangerchem.weebly.com/uploads/8/3/7/0/8370959/the_chemistry_of_latent_fingerprints.pdf">http://grangerchem.weebly.com/uploads/8/3/7/0/8370959/the_chemistry_of_latent_fingerprints.pdf</a></li> <li>3. <a href="https://ncforensics.wordpress.com/2013/06/20/techniques-for-collecting-and-analyzing-fingerprints/">https://ncforensics.wordpress.com/2013/06/20/techniques-for-collecting-and-analyzing-fingerprints/</a></li> <li>4. <a href="http://www3.ntu.edu.sg/home/EXDJiang/Encyclopedia1.pdf">http://www3.ntu.edu.sg/home/EXDJiang/Encyclopedia1.pdf</a></li> </ol>		
<b>12. Books Recommended</b>		
<ol style="list-style-type: none"> <li>1. Bridges, B.C; Criminal Investigation, Practical Fingerprinting, Thumb Impression, Handwriting expert Testimony, Opinion Evidence., Univ. Book Agency, Allhabad,2000</li> <li>2. Mehta, M.K; Identification of Thumb impression &amp; cross examination of Fingerprints,</li> <li>3. N.M. Tripathi Pub. Bombay, 1980.</li> <li>4. Chatterjee, S.K; Speculation in Fingerprint Identification, Jantralekha printing Works, Kolkata, 1981.</li> <li>5. Cowger James F; Friction Ridge Skin- Comparison &amp; Identification of Fingerprints, CRC Press, NY, 1993</li> <li>6. Cossidy, M.J; Footwear Identification, Royal Canadian, Mounted Police, 1980.</li> <li>7. Iannavelli, A.V; Ear Identification, Forensic Identification Series, Paramount,1989.</li> <li>8. Henry, C.L. &amp; Ganesslen, R.E; Advances in Fingerprint Technology, CRC Press, London,1991.</li> <li>9. Jain, A.K., Flynn, P.&amp; Ross A.A., Handbook of Biometrics, Springer, New York 2008</li> </ol>		

## PAPER-II

<b>1.Name of the Department: Forensic Sciences</b>						
<b>2.Course Name</b>	<b>DEVELOPING METHODS</b>		<b>L</b>	<b>T</b>	<b>P</b>	
<b>3.Course Code</b>	<b>17110207</b>		2	0	0	
<b>4.Type of Course (use tick mark)</b>	<b>Core (<input type="checkbox"/>)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>	
<b>5. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd ( <input type="checkbox"/> )	Either Sem ()	Every Sem ()
<b>7.Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>8.Course Description:</b>						
This core paper in Forensic Sciences, help to understand the Individual identification, Methods of Taking Fingerprints, Fingerprint Developing Methods from chemical, physical techniques.						
<b>9.Course Outcomes (COs):</b>						
Upon successful completion of this course, the student will be able to: <b>CO1:</b> Understand the developing techniques of fingerprint and they can use in the crime investigation. <b>CO2:</b> Know the application of light sources in fingerprint detection. <b>CO3:</b> Develop latent fingerprints on crime scene.						
<b>10.Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures =</b>	<b>Title of the unit: Methods of Taking Fingerprints</b>				
From living and dead persons, preserving and lifting of fingerprints. Comparison Protocols: Class and individual characteristics (Galton's details), different ridge characteristics						
<b>Unit – 2</b>	<b>Number of lectures =</b>	<b>Title of the unit: Fingerprint Developing Methods</b>				
Chemistry of latent fingerprint residue, factor contributing to latent fingerprints, Methods of Development of latent fingerprints using conventional methods–Powdering (Black and grey, fluorescent and magnetic), Fuming method, Vacuum Metal Deposition (VMD) Method.						
<b>Unit – 3</b>	<b>Number of lectures =</b>	<b>Title of the unit: Chemical method</b>				
Reagent chemistry and formulations, Sequential Treatment and Enhancement, Photography of fingerprints, Digital Transmission. Application of light sources in fingerprint detection.  Preservation of developed fingerprints. Digital imaging for fingerprint enhancement. Fingerprinting the deceased. Developing fingerprints on gloves.						

Unit – 4	Number of lectures =	Title of the unit: Other impression
Importance of footprints. Casting of foot prints, Electrostatic lifting of latent foot prints. Palm prints. Lip prints - Nature, location, collection and examination of lip prints. Ear prints and their significance. Palm prints and their historical importance.		
<b>11. Brief Description of self learning / E-learning component</b>		
<ol style="list-style-type: none"> <li>1. <a href="http://grangerchem.weebly.com/uploads/8/3/7/0/8370959/the_chemistry_of_latent_fingerprints.pdf">http://grangerchem.weebly.com/uploads/8/3/7/0/8370959/the_chemistry_of_latent_fingerprints.pdf</a></li> <li>2. <a href="https://ncforensics.wordpress.com/2013/06/20/techniques-for-collecting-and-analyzing-fingerprints/">https://ncforensics.wordpress.com/2013/06/20/techniques-for-collecting-and-analyzing-fingerprints/</a></li> <li>3. <a href="http://www3.ntu.edu.sg/home/EXDJiang/Encyclopedia1.pdf">http://www3.ntu.edu.sg/home/EXDJiang/Encyclopedia1.pdf</a></li> </ol>		
<b>12. Books Recommended</b>		
<ol style="list-style-type: none"> <li>1. Saferstein, R.(1990) Criminalistics, Prentice Hall, New York.</li> <li>2. David R. Ashbaugh (1999) Quantitative and Qualitative Friction Ridge Analysis, CRC Press.</li> <li>3. E. Roland Menzel (1999) Fingerprint Detection with Lasers, 2nd Ed., Marcel Dekker, Inc. USA.</li> <li>4. James F. Cowger (1993) Friction Ridge skin, CRC Press London.</li> <li>5. Mehta, M.K (1980) Identification of Thumb Impression &amp; Cross Examination of Finger Prints, N.M. Tripathi Pub. Bombay.</li> <li>6. Moenssens (1975) Finger Prints Techniques, Chitton Book Co. Philadelphia, NY.</li> <li>7. Chatterjee S.K. (1981) Speculation in Finger Print Identification, Jantralekha Printing Works, Kolkata</li> </ol>		

**PAPER-III**

<b>1.Name of the Department: Forensic Sciences</b>						
<b>2.Course Name</b>	<b>PHYSICAL EVIDENCES</b>			<b>L</b>	<b>T</b>	<b>P</b>
<b>3.Course Code</b>	<b>17110208</b>			2	0	0
<b>4.Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>5. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (☐)	Either Sem ()	Every Sem ()
<b>7.Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>8.Course description</b>						
This core paper in Forensic Sciences, help the student to understand forensic examination. Glass; Composition, types, fractures, forensic examination, the effects of projectiles on Glass						
<b>9.Course Outcomes (COs):</b>						
After studying this paper the students will know – <b>CO-1:</b> The different patterns of Textiles and fabrics and its Forensic examination. <b>CO-2:</b> General features of Soil, glass, Paint and its Forensic Application. <b>CO-3:</b> Different types of evidences such as impressions, fingerprints and blood stains and legal aspects. <b>CO-4:</b> Collection, preservation and examination of biological evidences.						
<b>10.Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures =</b>	<b>Title of the unit: Fibers &amp; Paints</b>				
Textile Fibers, Yarns, Fabric construction, Fabric characteristics, Fabric manufacture, Microscopic characteristics, Birefringence, Fluorescence Microscopy, Colors in textile, Color Assessment, Chemical properties, Paint: Introduction, Composition of paint, Paint Analysis, Paint Manufacturing, Collection, preliminary analysis of paints samples, Interpretations						
<b>Unit – 2</b>	<b>Number of lectures</b>	<b>Title of the unit: Soil and Glass</b>				
Soil and Glass:- Introduction, Collection of Soil Evidence, forensic examination. Glass; Composition, types, fractures, forensic examination, the effects of projectiles on Glass, lamp analysis. Tool marks, various types of tool marks, comparisons; questioned documents, computer forensics, audio-video evidences						
<b>Unit – 3</b>	<b>Number of lectures =</b>	<b>Title of the unit: Impression Evidence</b>				
Impression Evidence: Types of Impression Evidence, Significance of Impression Evidence, Footwear Impressions (General Characteristic), Footwear Impressions at the Crime Scene, Casting three Dimensional						

Footwear impressions, Lifting imprints, Comparison of footwear impressions, Tire Impression Evidence, skid marks, Serial numbers restoration. Fingerprints, footprints, ear prints, lip prints etc. their classification, collection and preservation. Blood stain pattern analysis. Droplet Directionality from bloodstain patterns, Determination of Point of Convergence and Point of Origin. Impact spatter and mechanisms. Importance and Legal aspects of BPA.		
<b>Unit – 4</b>	<b>Number of lectures</b> =	<b>Title of the unit: Biological Evidences</b>
Introduction of biological evidences like hair, body fluids(blood, saliva, semen, sweat, milk), fecal matter, DNA etc. and chemical evidences including explosives, chemicals, poisons etc. their collection and preservation.		
<b>11. Brief Description of self learning / E-learning component</b>		
<a href="https://www.youtube.com/watch?v=scP7L6rgovk">https://www.youtube.com/watch?v=scP7L6rgovk</a> <a href="https://www.youtube.com/watch?v=g8wgAi16O-A">https://www.youtube.com/watch?v=g8wgAi16O-A</a> <a href="https://www.youtube.com/watch?v=wPny8RQg7ts">https://www.youtube.com/watch?v=wPny8RQg7ts</a>		
<b>12. Books Recommended</b>		
<ol style="list-style-type: none"> <li>1. Bodziak, W., Footwear Impression Evidence (2<sup>nd</sup> Ed.) CRC Press, Boca Raton, Florida, 2000.</li> <li>2. DeForest, P., Gaensslen, R., and Lee, H., Forensic Science; An Introduction to Criminalistics, McGraw Hill, New York, 1983.</li> <li>3. Fisher, B., Techniques of Crime Scene Investigation (6<sup>th</sup> Edn.) CRC Press, Boca Raton, Florida, 2000.</li> <li>4. James, S. H. And Nordby, J. J. (Eds), Forensic Science - An Introduction to Scientific and Investigative Techniques, CRC Press, London, 2003.</li> <li>5. James, S., and Eskerc, W., Interpretation of Blood Stain Evidence at Crime Scenes, (2<sup>nd</sup> Edn) CRC Press, Boca Raton, Florida. 1999.</li> </ol>		

**PAPER IV (17110209)- PRACTICALS**

<b>01. Name of the Department:</b> Forensic Sciences						
<b>02. Course Name</b>	<b>Practical –II</b>			<b>L</b>	<b>T</b>	<b>P</b>
<b>03. Course Code</b>	17110209			0	0	4
<b>04. Type of Course (use tick mark)</b>		<b>Core</b> (☐)	<b>DSE</b> ()	<b>AEC</b> ()	<b>SEC</b> ()	<b>OE</b> ()
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (☐)	Either Sem ()	Every Sem ()
<b>06. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = 02</b>		<b>Practical = 08</b>		
<b>08. Course Outcomes (COs):</b>						
<p><b>CO-1:</b> Students would be able to take and classify fingerprints.  <b>CO-2:</b> They would also be able to compare fingerprints.  <b>CO-3:</b> They would utilize different developing methods of latent/chance prints.  <b>CO-4:</b> They would be able to understand poroscopy.</p>						
<b>Practicals</b>						
<ol style="list-style-type: none"> <li>1. To obtain Plain and rolled inked finger prints.</li> <li>2. To identify the finger Print Patterns.</li> <li>3. To perform Ridge tracing and Ridge counting.</li> <li>4. To identify the Ridge characteristics (Minutia).</li> <li>5. To compare the finger Prints.</li> <li>6. To develop latent finger Prints with powdering methods.</li> <li>7. To develop latent finger Prints with fuming methods.</li> <li>8. To develop latent finger Prints with chemical methods.</li> </ol>						

**PAPER V (17110210) - SEMINAR AND ASSIGNMENTS**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>Assignments &amp; Seminars</b>		<b>L</b>	<b>T</b>	<b>P</b>	
<b>03. Course Code</b>	<b>17110210</b>		0	2		0
<b>04. Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (☐)	Either Sem ()	Every Sem ()
<b>06. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = 02</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to –						
<b>CO1:</b> Enhance the Communication skills and thorough knowledge on particular topics. <b>CO2:</b> Work and preparation on Assignments based on case studies.						



## SPECIALIZATION (CYBER FORENSIC)

### PAPER-I

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>CYBER SECURITY</b>	<b>L</b>	<b>T</b>	<b>P</b>		
<b>03. Course Code</b>	<b>17110211</b>	2	0	0		
<b>04. Type of Course (use tick mark)</b>	<b>Core</b> ( <input type="checkbox"/> )	<b>DSE</b> ()	<b>AEC</b> ()	<b>SEC</b> ()	<b>OE</b> ()	
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd ( <input type="checkbox"/> )	Either Sem ()	Every Sem ()
<b>07. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to – <b>CO1.</b> Analyze various computer forensics systems. <b>CO2.</b> Illustrate the methods for data recovery, evidence collection and data seizure. <b>CO3.</b> Summarize duplication and preservation of digital evidence						
<b>9. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures =</b>	<b>Title of the unit:</b> Authorship attribution.				
Identifying e-mail authors, application to investigative profiling, Evidence extraction, link analysis, and link discovery, Evidence extraction and link analysis, Link discovery Introduction to Cybercrimes, Distinction between cyber crime and conventional crimes, Reasons for commission of cyber crime, Kinds of cyber crimes – cyber stalking; cyber pornography; forgery and fraud; crime related to IPRs.						
<b>Unit – 2</b>	<b>Number of lectures =</b>	<b>Title of the unit:</b> Steganography				
Introduction, History, Steganography types: Image steganography, video steganography, audio steganography, text steganography. Various methods for hiding the message into images. Use of steganography in Biometrics, parameters affecting steganography, steganalysis.						
<b>Unit – 3</b>	<b>Number of lectures =</b>	<b>Title of the unit:</b> Computer Forensics in Forensic Accounting				
Auditing and fraud detection, Current Practice: Introduction, Electronic evidence, Secure boot, write blockers and forensic platforms, Disk file organization, Disk and file imaging and analysis, File deletion, media sanitization, Mobile telephones, PDAs, Discovery of electronic evidence, Forensic tools, EnCaseILook Investigator, CFIT, Emerging procedures and standards, Seizure and analysis of electronic evidence, National and international standards, Computer crime legislation and computer forensics, 53 Council of Europe convention on cybercrime and other international activities, Documenting And Reporting, Evaluation And Interpretation Of Results, Reporting Conclusions, Case Records.						

Unit – 4	Number of lectures =	Title of the unit: Cyber crimes
<p>Cyber terrorism; Spamming, Phishing, Privacy and National Security in Cyberspace, Cyber Defamation and hate speech, computer vandalism etc. Relevant provisions under Information Technology Act, 2000, Indian Penal Code, 1860. Jurisdictional challenges in cyberspace, Investigation challenges in cyberspace, Emerging trends in Information Technology Act, 2000, Need to regulate internet, country specific cyber laws, Legal recognition of electronic records and digital signature, measures to adapt electronic governance, inadequacy in IT act. Report Writing &amp; Court Room Testimony.</p>		
<p><b>10. Books Recommended</b></p>		
<ol style="list-style-type: none"> <li>1. Nathan Clarke (2010) Computer Forensics</li> <li>2. Eoghan Casey BS MA (2001) Handbook of Computer Crime Investigation: Forensic Tools and Technology</li> <li>3. Marjie T. Britz (2003) Computer Forensics and Cyber Crime: An Introduction</li> <li>4. Linda Volonino and Reynaldo Anzaldua (2008) Computer Forensics For Dummies</li> <li>5. Eoghan Casey (2009) Handbook of Digital Forensics and Investigation</li> <li>6. Warren G. Kruse II and Jay G. Heiser (2001) Computer Forensics: Incident Response Essentials</li> <li>7. Robert C. Newman (2007) Computer Forensics: Evidence, Collection and Management</li> <li>8. Michael A. Caloyannides (2001) Computer Forensics and Privacy (Artech House computer security series)</li> <li>9. Eoghan Casey BS MA (2001) Handbook of Computer Crime Investigation: Forensic Tools and Technology</li> <li>10. The Indian IT Act 2000.</li> <li>11. Steve Bunting (2007) The Official EnCE - EnCase Certified Examiner Study Guide.</li> <li>12. Robert C. Newman (2007) Computer Forensics: Evidence, Collection and Management</li> <li>13. Eoghan Casey BS MA (2001) Handbook of Computer Crime Investigation: Forensic Tools and Technology</li> <li>14. Eoghan Casey (2009) Handbook of Digital Forensics and Investigation</li> <li>15. Tewari, R.K., Sastry, P.K. and Ravikumar, K.V. (2003) Computer Crime &amp; Computer Forensics select Publisher, New Delhi.</li> <li>16. Mahajan T.S. and Singh, Didar (2003) : Computer Networking and HTML; Gurunanak Publication, Patiala.</li> </ol>		

**PAPER-II**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>DIGITAL FORENSIC</b>			<b>L</b>	<b>T</b>	<b>P</b>
<b>03. Course Code</b>	<b>17110212</b>			2	0	0
<b>04. Type of Course (use tick mark)</b>	<b>Core (☐)</b>	<b>DSE ( )</b>	<b>AEC ( )</b>	<b>SEC ( )</b>	<b>OE ( )</b>	
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ( )	Odd (☐)	Either Sem ( )	Every Sem ( )
<b>07. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to –						
<b>CO1.</b> Analyze various computer hardware.						
<b>CO2.</b> Illustrate the methods for data recovery, evidence collection and data seizure.						
<b>9. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures =</b>	<b>Title of the unit: Fundamentals and Concepts</b>				
Fundamentals of computers Hardware and accessories – development of hard disk, physical construction, CHS and LBA addressing, encoding methods and formats. Memory and processor. Methods of storing data. Operating system. Software. Introduction to network, LAN, WAN and MAN..						
<b>Unit – 2</b>	<b>Number of lectures =</b>	<b>Title of the unit: Computer Forensic Investigation</b>				
Seizure of computers: Preparations to be made before seizure, Actions at the scene, Treatment of exhibits, bitstream (exact copies) of the original media, Establishing a case in computer forensics, Computer forensic analysis within the forensic tradition, Investigation: Investigating on various imaging methods. Lay down the image provided onto a hard disk and provide a disk map of the suspect drive. Extraction of all relevant information from a hard disk. Instruction on the acquisition, collection and seizure of magnetic media. How to best acquire, collect or seize the various operating systems. Legal and privacy issues, Forensic examination procedures, Preparing and verifying forensically sterile storage media. Various Image Enhancement Techniques: Image Enhancement in the Spatial Domain (Gray level transformations, Histogram processing, Arithmetic and logic operations, Spatial filtering: Smoothing and sharpening filters) Image Enhancement in the Frequency Domain (Frequency domain filters: Smoothing and Sharpening filters Homomorphic filtering).						
<b>Unit – 3</b>	<b>Number of lectures =</b>	<b>Title of the unit: Computer Crimes</b>				
Definition and types of computer crimes. Distinction between computer crimes and conventional crimes. Reasons for commission of computer crimes. Breaching security and operation of digital systems. Computer virus, and computer worm – Trojan horse, trap door, super zapping, logic bombs. Types of computer crimes – computer stalking, pornography, hacking, crimes related to intellectual property rights, computer terrorism, hate						

speech, private and national security in cyber space. An overview of hacking, spamming, phishing and stalking.		
<b>Unit – 4</b>	<b>Number of lectures =</b>	<b>Title of the unit: IT Act 2000</b>
Information Technology Act, 2000, Indian Penal Code, 1860. Jurisdictional challenges in cyberspace, Investigation challenges in cyberspace, Emerging trends in Information Technology Act, 2000, Need to regulate internet, country specific cyber laws, Legal recognition of electronic records and digital signature, measures to adapt electronic governance, inadequacy in IT act. Report Writing & Court Room Testimony.		
<b>10. Books Recommended</b>		
<ol style="list-style-type: none"> <li>1. Robert C. Newman (2007) Computer Forensics: Evidence, Collection and Management</li> <li>2. Michael A. Caloyannides (2001) Computer Forensics and Privacy (Artech House computer security series)</li> <li>3. Eoghan Casey BS MA (2001) Handbook of Computer Crime Investigation: Forensic Tools and Technology</li> <li>4. The Indian IT Act 2000.</li> <li>5. Steve Bunting (2007) The Official EnCE - EnCase Certified Examiner Study Guide.</li> <li>6. Robert C. Newman (2007) Computer Forensics: Evidence, Collection and Management</li> <li>7. Eoghan Casey BS MA (2001) Handbook of Computer Crime Investigation: Forensic Tools and Technology</li> <li>8. Eoghan Casey (2009) Handbook of Digital Forensics and Investigation</li> <li>9. 15. Tewari, R.K., Sastry, P.K. and Ravikumar, K.V. (2003) Computer Crime &amp; Computer Forensics select Publisher, New Delhi.</li> </ol>		

**PAPER-III**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>DIGITAL EVIDENCE</b>			<b>L</b>	<b>T</b>	<b>P</b>
<b>03. Course Code</b>	<b>17110213</b>			2	0	0
<b>04. Type of Course (use tick mark)</b>	<b>Core</b> ( <input type="checkbox"/> )	<b>DSE</b> ()	<b>AEC</b> ()	<b>SEC</b> ()	<b>OE</b> ()	
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd ( <input type="checkbox"/> )	Either Sem ()	Every Sem ()
<b>07. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to – <b>CO1.</b> know about various operating system. <b>CO2.</b> Illustrate the methods for cryptography. <b>CO3.</b> Summarize duplication and preservation of digital evidence						
<b>9. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures =</b>	<b>Title of the unit: Digital Evidence:</b>				
Increasing awareness of digital evidence, challenging aspects of digital evidence, challenging aspects of cyber trail, forensic science and digital evidence, computer image verification and authentication, digital image watermarking and its application in forensic science, Various techniques for digital watermarking, Logical structures of the Microsoft operating system FAT file system, DOS and Windows boot process, How to recover deleted files, The significance and determination of the creation date and time. Web browser security, web proxy, IPv6, Access control techniques.						
<b>Unit – 2</b>	<b>Number of lectures =</b>	<b>Title of the unit: Digital signature and cryptography</b>				
Signature in paper based society, Transfer of computer based documents, digital signature and authentication and breaching techniques, digital signature generation and verification, certification of public keys, certification of authority. Passwords and encryption techniques: Importance of keeping a log, Explanation of passwords keys and hashes. Security using Cryptography: introduction, types of Cryptography, SSL/TLS, different types of ciphers like caesar cipher, mono alphabetic cipher, poly alphabetic cipher etc. Diffie- Hellman key exchange, and key management protocols.						
<b>Unit – 3</b>	<b>Number of lectures =</b>	<b>Title of the unit: Basic of Computer and Internet</b>				
Basic of Computer and Internet: Introduction, Computer generations, Software and Hardware Operating systems including: DOS, Windows, NT/2000/XP, Linux. Internet: Basics setup and internetworking, Forensic utility of computer and internet. Computer and cyber crimes. Printing of counterfeit currency. Computer scanners. Software piracy. Data recovery. Authenticity of images and videos. Network computer crimes and their types.						

Unauthorized access and interception. Hacking. Computer viruses and security.		
<b>Unit – 4</b>	<b>Number of lectures =</b>	<b>Title of the unit:</b> Authorship attribution.
<p>identifying e-mail authors, application to investigative profiling, Evidence extraction, link analysis, and link discovery, Evidence extraction and link analysis, Link discovery Introduction to Cybercrimes, Distinction between cyber crime and conventional crimes, Reasons for commission of cyber crime, Kinds of cyber crimes – cyber stalking; cyber pornography; forgery and fraud; crime related to IPRs; Cyber terrorism; Spamming, Phishing, Privacy and National Security in Cyberspace, Cyber Defamation and hate speech, computer vandalism etc. Relevant provisions under Information Technology Act, 2000, Indian Penal Code, 1860. Jurisdictional challenges in cyberspace, Investigation challenges in cyberspace, Emerging trends in Information Technology Act, 2000, Need to regulate internet, country specific cyber laws, Legal recognition of electronic records and digital signature, measures to adapt electronic governance, inadequacy in IT act. Report Writing &amp; Court Room Testimony.</p>		
<b>10. Books Recommended</b>		
<ol style="list-style-type: none"> <li>1. Marjie T. Britz (2003) Computer Forensics and Cyber Crime: An Introduction</li> <li>2. Linda Volonino and Reynaldo Anzaldua (2008) Computer Forensics For Dummies</li> <li>3. Eoghan Casey (2009) Handbook of Digital Forensics and Investigation</li> <li>4. Warren G. Kruse II and Jay G. Heiser (2001) Computer Forensics: Incident Response Essentials</li> <li>5. Robert C. Newman (2007) Computer Forensics: Evidence, Collection and Management</li> <li>6. Michael A. Caloyannides (2001) Computer Forensics and Privacy (Artech House computer security series)</li> <li>7. Eoghan Casey BS MA (2001) Handbook of Computer Crime Investigation: Forensic Tools and Technology</li> <li>8. The Indian IT Act 2000.</li> <li>9. Steve Bunting (2007) The Official EnCE - EnCase Certified Examiner Study Guide.</li> <li>10. Robert C. Newman (2007) Computer Forensics: Evidence, Collection and Management</li> </ol>		

**PAPER IV (17110214) – PRACTICALS**

**PAPER V (17110215) - SEMINAR AND ASSIGNMENTS**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>Assignments &amp; Seminars</b>		<b>L</b>	<b>T</b>	<b>P</b>	
<b>03. Course Code</b>	<b>17110215</b>		0	2	0	
<b>04. Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (☐)	Either Sem ()	Every Sem ()
<b>06. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = 02</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to –						
<b>CO1:</b> Enhance the Communication skills and thorough knowledge on particular topics.						
<b>CO2:</b> Work and preparation on Assignments based on case studies.						

**SPECIALIZATION (QUESTIONED DOCUMENTS)**

**PAPER-I**

<b>1. Name of the Department: Forensic Sciences</b>						
<b>2. Course Name</b>	<b>Questioned Documents and Examination</b>	<b>L</b>	<b>T</b>	<b>P</b>		
<b>3. Course Code</b>	<b>17110216</b>	<b>2</b>	<b>0</b>	<b>0</b>		
<b>4. Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>5. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	<b>Even (☐)</b>	<b>Odd ()</b>	<b>Either Sem ()</b>	<b>Every Sem ()</b>
<b>7. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>8. Course Description:</b>						
This core paper in Forensic Sciences, help to understand the importance, classification, nature, examination of documents. Forgery and its types and characteristics, identification and examination of forgeries. Decipherment of secret indented and charred documents: Preservation of documents						
<b>9. Course Outcomes (COs):</b>						
Upon successful completion of this course, the student will be able to: <b>CO1.</b> Develop an understanding on Individuals Characteristics feature of handwriting. <b>CO2.</b> Different instrumental techniques that use in document examinations.						
<b>10. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures</b> =	<b>Title of the unit: Questioned Document</b>				
Definition of Document, Questioned Document, Importance, Classification, nature and different types of document, Scope, development, of Questioned documents. Preliminary Examination of questioned documents. Importance of Document in Criminal Investigations.						
<b>Unit – 2</b>	<b>Number of lectures</b> =	<b>Title of the unit: Handwriting</b>				
Handwriting: General and individual characteristics of handwriting. Development of individuality in handwriting. Examination and comparison of handwritings. Natural variations and fundamental divergences in handwritings						
<b>Unit – 3</b>	<b>Number of lectures</b> =	<b>Title of the unit: Forgeries</b>				
Forgeries: Forgery and its types and characteristics, identification and examination of forgeries. Decipherment of secret						



indented and charred documents: Preservation of documents, Examination of seal and other mechanical impressions, examination of sequence of intersecting of strokes. Standards for Comparison and Disguise etc

<b>Unit – 4</b>	<b>Number of lectures</b>	<b>Title of the unit: Age of Document &amp; Alterations</b>
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Age of Document & Alterations: Determination of Age of Document- Absolute/relative Age, Indented and Invisible Writings, Alterations in the document: erasures, additions, overwriting and obliterations. Comparison of type written/printed matter: Working of typewriter, Printing and Machine Defects, alterations in typed text, various type of typewriting devices- check writing machines, electronic typewriter and proportional spacing typewriter. Comparison of Printed matter: Various Printing Processes. Currency Note examination: Identifying features of fake and genuine Indian currency notes.

#### 11. Brief Description of self learning / E-learning component

1. <https://nij.gov/topics/forensics/evidence/questioned-documents/pages/welcome.aspx>
2. <https://www.thefreedictionary.com/forgeries>
3. [http://www.analyst.gov.lk/web/index.php?option=com\\_content&view=article&id=52&Itemid=60&lang=en](http://www.analyst.gov.lk/web/index.php?option=com_content&view=article&id=52&Itemid=60&lang=en)

#### 12. Books Recommended

1. Huber, A. R. and Headrick, A.M. (1999) Handwriting Identification: Facts and Fundamentals CRC LLC
2. Ellen, D (1997) The scientific examination of Documents, Methods and techniques. 2nd ed., Taylor & Francis Ltd.
3. Morris (2000) Forensic Handwriting Identification (fundamental concepts and Principles)
4. Harrison, W.R. (1966) Suspect Documents & their Scientific Examination, Sweet & Maxwell Ltd., London. 5. Hilton, O (1982) The Scientific Examination of Questioned Document, Elsevier North Holland Inc., New York.
5. Mehta, M. K. (1970) The identification of Handwriting & Cross Examination of Experts, N.M. Tripathi, Allahabad.
6. Saxena's Law & Techniques Relating to Finger Prints, Foot Prints & Detection of Forgery, Central Law Agency, Allahabad (Ed. A.K. Singla).
7. Osborn, A. S. (1929) Questioned Documents, Boyd Printing Co., Chicago.
8. Saferstein, R.(1990) Criminalistics, Prentice Hall, New York.

## PAPER-II

<b>1. Name of the Department: Forensic Sciences</b>						
<b>2. Course Name</b>	<b>FORGERIES</b>	<b>L</b>	<b>T</b>	<b>P</b>		
<b>3. Course Code</b>	<b>17110217</b>	2	0	0		
<b>4. Type of Course (use tick mark)</b>	<b>Core (<input type="checkbox"/>)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>	
<b>5. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ( <input type="checkbox"/> )	Odd ()	Either Sem ()	Every Sem ()
<b>7. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>8. Course Description:</b>						
This core paper in Forensic Sciences, help to understand the importance, classification, nature, examination of documents. Forgery and its types and characteristics, identification and examination of forgeries. Decipherment of secret indented and charred documents: Preservation of documents						
<b>9. Course Outcomes (COs):</b>						
Upon successful completion of this course, the student will be able to: <b>CO1.</b> Examine the documents. <b>CO2.</b> Different instrumental techniques that use in document examinations.						
<b>10. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures</b> =	<b>Title of the unit: Nature and Scope of Questioned Documents</b>				
Definition of questioned documents. Types of questioned documents. Preliminary examination of documents. Basic tools needed for forensic documents' examination – ultraviolet, visible, infrared and fluorescence spectroscopy, photomicrography, microphotography, visible spectral comparator, electrostatic detection apparatus. Determining the age and relative age of documents.						
<b>Unit – 2</b>	<b>Number of lectures</b> =	<b>Title of the unit: Comparison of Documents Comparison of handwriting.</b>				
Development of individuality in handwriting. Natural variations and fundamental divergences in handwritings. Class and individual characteristics. Merits and demerits of exemplar and non-exemplar samples during comparison of handwriting. Standards for comparison of handwriting. Comparison of paper, ink, printed documents, typed documents, Xeroxed documents.						
<b>Unit – 3</b>	<b>Number of lectures</b> =	<b>Title of the unit: Forgeries</b>				

<p>Forgeries: Forgery and its types and characteristics, identification and examination of forgeries. Decipherment of secret indented and charred documents: Preservation of documents, Examination of seal and other mechanical impressions, examination of sequence of intersecting of strokes. Standards for Comparison and Disguise etc</p>		
<b>Unit – 4</b>	<b>Number of lectures</b> =	<b>Title of the unit: Alteration in documents</b>
<p>Alterations in documents, including erasures, additions, over-writings and obliterations. Indented and invisible writings. Charred documents. Examination of counterfeit Indian currency notes, passports, visas and stamp papers. Disguised writing and anonymous letters.</p>		
<p><b>11. Brief Description of self learning / E-learning component</b></p>		
<p><a href="https://nij.gov/topics/forensics/evidence/questioned-documents/pages/welcome.aspx">https://nij.gov/topics/forensics/evidence/questioned-documents/pages/welcome.aspx</a>  <a href="https://www.thefreedictionary.com/forgeries">https://www.thefreedictionary.com/forgeries</a>  <a href="http://www.analyst.gov.lk/web/index.php?option=com_content&amp;view=article&amp;id=52&amp;Itemid=60&amp;lang=en">http://www.analyst.gov.lk/web/index.php?option=com_content&amp;view=article&amp;id=52&amp;Itemid=60&amp;lang=en</a></p>		
<p><b>12. Books Recommended</b></p>		
<ol style="list-style-type: none"> <li>1. Ellen, D (1997) The scientific examination of Documents, Methods and techniques. 2nd ed., Taylor &amp; Francis Ltd.</li> <li>2. Morris (2000) Forensic Handwriting Identification (fundamental concepts and Principles)</li> <li>3. Harrison, W.R. (1966) Suspect Documents &amp; their Scientific Examination, Sweet &amp; Maxwell Ltd., London. 5. Hilton, O (1982) The Scientific Examination of Questioned Document, Elsevier North Holland Inc., New York.</li> <li>4. Mehta, M. K. (1970) The identification of Handwriting &amp; Cross Examination of Experts, N.M. Tripathi, Allahabad.</li> <li>5. Saxena's Law &amp; Techniques Relating to Finger Prints, Foot Prints &amp; Detection of Forgery, Central Law Agency, Allahabad (Ed. A.K. Singla).</li> <li>6. Osborn, A. S. (1929) Questioned Documents, Boyd Printing Co., Chicago.</li> </ol>		

**PAPER-III**

<b>1. Name of the Department: Forensic Sciences</b>						
<b>2. Course Name</b>	<b>TYPEWRITERS AND DIGITAL SIGNATURE</b>	<b>L</b>	<b>T</b>	<b>P</b>		
<b>3. Course Code</b>	<b>17110218</b>	2	0	0		
<b>4. Type of Course (use tick mark)</b>	<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>	
<b>5. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even (☐)	Odd ()	Either Sem ()	Every Sem ()
<b>7. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>8. Course Description:</b>						
This core paper in Forensic Sciences, help to understand the importance, classification, nature, examination of typewriting. Typewriter Forgery and its types and characteristics.						
<b>9. Course Outcomes (COs):</b>						
Upon successful completion of this course, the student will be able to: <b>CO1.</b> Develop an understanding on Individuals Characteristics feature of typewriters. <b>CO2.</b> Different instrumental techniques that use in typewriting examinations, fake currency note.						
<b>10. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures</b> =	<b>Title of the unit:</b> Types of typewriter and currency note				
Working of typewriter, Printing and Machine Defects, alterations in typed text, various type of typewriting devices- check writing machines, electronic typewriter and proportional spacing typewriter. Identifying features of fake and genuine Indian currency notes.						
<b>Unit – 2</b>	<b>Number of lectures</b> =	<b>Title of the unit:</b> Specimens of typewriting				
Procedure for preparing specimens of typewriting, standard materials for comparison with questioned typewriting and other mechanical impressions. Various Printing Processes, printed matter as questioned documents.						
<b>Unit – 3</b>	<b>Number of lectures</b> =	<b>Title of the unit:</b> Digital signature				
Signature in paper based society, Transfer of computer based documents, digital signature and authentication, digital signature generation and verification, certification of public keys, certification of authority. Passwords						

and encryption techniques: Importance of keeping a log, Explanation of passwords keys and hashes.		
<b>Unit – 4</b>	<b>Number of lectures</b> =	<b>Title of the unit:</b> Cryptography
Introduction, types of Cryptography, different types of ciphers like caesar cipher, mono alphabetic cipher, poly alphabetic cipher etc. Diffie- Hellman key exchange and key management protocols. Steganography: Introduction, History, Steganography types.		
<b>11. Brief Description of self learning / E-learning component</b>		
<ol style="list-style-type: none"> <li>1. <a href="http://grangerchem.weebly.com/uploads/8/3/7/0/8370959/the_chemistry_of_latent_fingerprints.pdf">http://grangerchem.weebly.com/uploads/8/3/7/0/8370959/the_chemistry_of_latent_fingerprints.pdf</a></li> <li>2. <a href="https://ncforensics.wordpress.com/2013/06/20/techniques-for-collecting-and-analyzing-fingerprints/">https://ncforensics.wordpress.com/2013/06/20/techniques-for-collecting-and-analyzing-fingerprints/</a></li> <li>3. <a href="http://www3.ntu.edu.sg/home/EXDJiang/Encyclopidia1.pdf">http://www3.ntu.edu.sg/home/EXDJiang/Encyclopidia1.pdf</a></li> </ol>		
<b>12. Books Recommended</b>		
<ol style="list-style-type: none"> <li>1. Huber, A. R. and Headrick, A.M. (1999) Handwriting Identification: Facts and Fundamentals CRC LLC</li> <li>2. Ellen, D (1997) The scientific examination of Documents, Methods and techniques. 2nd ed., Taylor &amp; Francis Ltd.</li> <li>3. Morris (2000) Forensic Handwriting Identification (fundamental concepts and Principles)</li> <li>4. Harrison, W.R. (1966) Suspect Documents &amp; their Scientific Examination, Sweet &amp; Maxwell Ltd., London. 5. Hilton, O (1982) The Scientific Examination of Questioned Document, Elsevier North Holland Inc., New York.</li> <li>5. Mehta, M. K. (1970) The identification of Handwriting &amp; Cross Examination of Experts, N.M. Tripathi, Allahabad.</li> <li>6. Saxena's Law &amp; Techniques Relating to Finger Prints, Foot Prints &amp; Detection of Forgery, Central Law Agency, Allahabad (Ed. A.K. Singla).</li> <li>7. Osborn, A. S. (1929) Questioned Documents, Boyd Printing Co., Chicago.</li> <li>8. Saferstein, R.(1990) Criminalistics, Prentice Hall, New York.</li> </ol>		

**PAPER IV (17110219) – PRACTICALS**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>Practical –II</b>			<b>L</b>	<b>T</b>	<b>P</b>
<b>03. Course Code</b>	<b>17110219</b>			0	0	4
<b>04. Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (☐)	Either Sem ()	Every Sem ()
<b>06. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures = Nil</b>		<b>Tutorials = Nil</b>		<b>Practical = 09</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to –						
<b>CO 1:</b> Identify and compare handwriting and signatures under question. <b>CO 2:</b> Detect written forgeries & disguise <b>CO 3:</b> Compare Typewritten scripts						
<b>10. Unit wise detailed content</b>						
<b>Practicals</b>						
	1.	Identification of Handwriting Individual Characteristics.				
	2.	Detection of Simulated & Traced forgery.				
	3.	Study of Disguise in handwriting.				
	4.	Comparison of Typewritten scripts				
	5.	Currency note examination				

**PAPER V (17110220) - SEMINAR AND ASSIGNMENTS**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>Assignments &amp; Seminars</b>	<b>L</b>	<b>T</b>	<b>P</b>		
<b>03. Course Code</b>	<b>17110220</b>	<b>0</b>	<b>2</b>	<b>0</b>		
<b>04. Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	<b>Even ()</b>	<b>Odd (☐)</b>	<b>Either Sem ()</b>	<b>Every Sem ()</b>
<b>06. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = 02</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to –						
<b>CO1:</b> Enhance the Communication skills and thorough knowledge on particular topics.						
<b>CO2:</b> Work and preparation on Assignments based on case studies.						

**SPECIALIZATION (FORENSIC PHOTOGRAPHY)**

**PAPER-I**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>Forensic photography</b>	<b>L</b>	<b>T</b>	<b>P</b>		
<b>03. Course Code</b>	<b>17110221</b>	<b>2</b>	<b>0</b>	<b>0</b>		
<b>04. Type of Course (use tick mark)</b>	<b>Core (<input type="checkbox"/>)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>	
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	<b>Even ()</b>	<b>Odd (<input type="checkbox"/>)</b>	<b>Either Sem ()</b>	<b>Every Sem ()</b>
<b>07. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to – <b>CO1.</b> Know the principles and techniques of Black & White and color photography. <b>CO2.</b> Illustrate the methods for developing and Printing. Film development, developers <b>CO3</b> Preservation of Photographic evidence						
<b>9. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures =</b>	<b>Title of the unit: Basics</b>				
Definition of photography, basic concepts of videography/high speed videography, Introduction to photographic instruments, Basic principles and techniques of Black & White and color photography.						
<b>Unit – 2</b>	<b>Number of lectures =</b>	<b>Title of the unit: Camera</b>				
Camera: Cameras and its working, attachments of camera, types of camera lenses, Image sensors, spectral sensitivity of photographic materials, Reproduction of colors- photographic processing, Exposing, Camera exposure determination.						
<b>Unit – 3</b>	<b>Number of lectures =</b>	<b>Title of the unit: Working and principle</b>				
Working of Camera, F-Number, Depth of field, ISO, Developing and Printing. Film development, developers, fixers and controlled parameters.						



<b>Unit – 4</b>	<b>Number of lectures =</b>	<b>Title of the unit: Importance of photography.</b>
Importance of negative, 3D photography. Photographic evidence. Infrared and ultraviolet photography, Videography.		
<b>10. Books Recommended</b>		
1.		

## PAPER-II

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>DIGITAL FORENSIC</b>			<b>L</b>	<b>T</b>	<b>P</b>
<b>03. Course Code</b>	17110222			2	0	0
<b>04. Type of Course (use tick mark)</b>	<b>Core</b> ( <input type="checkbox"/> )	<b>DSE</b> ()	<b>AEC</b> ()	<b>SEC</b> ()	<b>OE</b> ()	
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd ( <input type="checkbox"/> )	Either Sem ()	Every Sem ()
<b>07. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to – <b>CO1.</b> Analyze various computer forensics systems. <b>CO2.</b> Illustrate the methods for data recovery, evidence collection and data seizure. <b>CO3.</b> Summarize duplication and preservation of digital evidence						
<b>9. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures =</b>	<b>Title of the unit: Fundamentals and Concepts</b>				
Fundamentals of computers Hardware and accessories – development of hard disk, physical construction, CHS and LBA addressing, encoding methods and formats. Memory and processor. Methods of storing data. Operating system. Software. Introduction to network, LAN, WAN and MAN..						
<b>Unit – 2</b>	<b>Number of lectures =</b>	<b>Title of the unit: Computer Forensic Investigation</b>				
Seizure of computers: Preparations to be made before seizure, Actions at the scene, Treatment of exhibits, bitstream (exact copies) of the original media, Establishing a case in computer forensics, Computer forensic analysis within the forensic tradition, Investigation: Investigating on various imaging methods. Lay down the image provided onto a hard disk and provide a disk map of the suspect drive. Extraction of all relevant information from a hard disk.Instruction on the acquisition, collection and seizure of magnetic media.How to best acquire, collect or seize the various operating systems.Legal and privacy issues, Forensic examination procedures, Preparing and verifying forensically sterile storage media. Various Image Enhancement Techniques: Image Enhancement in the Spatial Domain (Gray level transformations, Histogram processing, Arithmetic and logic operations, Spatial filtering: Smoothing and sharpening filters) Image Enhancement in the Frequency Domain (Frequency domain filters: Smoothing and Sharpening filters Homomorphic filtering).						
<b>Unit – 3</b>	<b>Number of lectures =</b>	<b>Title of the unit: Computer Crimes</b>				

<p>Definition and types of computer crimes. Distinction between computer crimes and conventional crimes. Reasons for commission of computer crimes. Breaching security and operation of digital systems. Computer virus, and computer worm – Trojan horse, trap door, super zapping, logic bombs. Types of computer crimes – computer stalking, pornography, hacking, crimes related to intellectual property rights, computer terrorism, hate speech, private and national security in cyber space. An overview of hacking, spamming, phishing and stalking.</p>		
<b>Unit – 4</b>	<b>Number of lectures =</b>	<b>Title of the unit: IT Act 2000</b>
<p>Information Technology Act, 2000, Indian Penal Code, 1860. Jurisdictional challenges in cyberspace, Investigation challenges in cyberspace, Emerging trends in Information Technology Act, 2000, Need to regulate internet, country specific cyber laws, Legal recognition of electronic records and digital signature, measures to adapt electronic governance, inadequacy in IT act. Report Writing &amp; Court Room Testimony.</p>		
<b>10. Books Recommended</b>		
<ol style="list-style-type: none"> <li>1. Eoghan Casey BS MA (2001) Handbook of Computer Crime Investigation: Forensic Tools and Technology</li> <li>2. The Indian IT Act 2000.</li> <li>3. Steve Bunting (2007) The Official EnCE - EnCase Certified Examiner Study Guide.</li> <li>4. Robert C. Newman (2007) Computer Forensics: Evidence, Collection and Management</li> <li>5. Eoghan Casey BS MA (2001) Handbook of Computer Crime Investigation: Forensic Tools and Technology</li> <li>6. Eoghan Casey (2009) Handbook of Digital Forensics and Investigation</li> <li>7. 15. Tewari, R.K., Sastry, P.K. and Ravikumar, K.V. (2003) Computer Crime &amp; Computer Forensics select Publisher, New Delhi.</li> </ol>		

**PAPER-III**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>Modern Developments in Photography</b>			<b>L</b>	<b>T</b>	<b>P</b>
<b>03. Course Code</b>	17110223			2	0	0
<b>04. Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (☐)	Either Sem ()	Every Sem ()
<b>07. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to – <b>CO1.</b> Analyze various basic principles and techniques of Black & White and color photography. <b>CO2.</b> Digital photography and advanced Crime scene and Laboratory photography <b>CO3.</b> Determination of authenticity and genuineness- forensic application.						
<b>9. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures =</b>	<b>Title of the unit:</b> Forensic Photography				
Basics: Definition of photography, basic concepts of videography/high speed videography, Introduction to photographic instruments, Basic principles and techniques of Black & White and color photography. Camera: Cameras and its working, attachments of camera,						
<b>Unit – 2</b>	<b>Number of lectures =</b>	<b>Title of the unit:</b> Types of camera lenses				
Image sensors, spectral sensitivity of photographic materials, reproduction of colors- photographic processing, Exposing, Camera exposure determination, Working of Camera, F-Number, Depth of field, ISO, Developing and Printing						
<b>Unit – 3</b>	<b>Number of lectures =</b>	<b>Title of the unit:</b> Modern Developments in Photography				
Digital photography and advanced Crime scene and Laboratory photography. Photoshop-development- digital images processing and manipulation- determination of authenticity and genuineness- forensic application.						
<b>10. Books Recommended</b>						

1. Nathan Clarke (2010) Computer Forensics

**PAPER IV (17110224) - PRACTICAL**

**PAPER V (17110225) - SEMINAR AND ASSIGNMENTS**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>Assignments &amp; Seminars</b>	<b>L</b>	<b>T</b>	<b>P</b>		
<b>03. Course Code</b>	<b>17110225</b>	0	2	0		
<b>04. Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (☐)	Either Sem ()	Every Sem ()
<b>06. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = 02</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to –						
<b>CO1:</b> Enhance the Communication skills and thorough knowledge on particular topics.						
<b>CO2:</b> Work and preparation on Assignments based on case studies.						

**SPECIALIZATION (FORENSIC CHEMISTRY AND TOXICOLOGY)**

**PAPER-1**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>FORENSIC CHEMISTRY</b>	<b>L</b>	<b>T</b>	<b>P</b>		
<b>03. Course Code</b>	<b>17110226</b>	<b>2</b>	<b>0</b>	<b>0</b>		
<b>04. Type of Course (use tick mark)</b>	<b>Core (□)</b>	<b>DSE ( )</b>	<b>AEC ( )</b>	<b>SEC ( )</b>	<b>OE ( )</b>	
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	<b>Even ( )</b>	<b>Odd (□)</b>	<b>Either Sem ( )</b>	<b>Every Sem ( )</b>
<b>07. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>08. Course Description:</b>						
This core paper in Forensic Sciences, help to understand the Scientific Principles and Instrumentation, Introduction and classification of Drugs of Abuse, Role of the Forensic Toxicologists, and Classification of poisons based on their origin and Chemical nature, mode of action. Types and Trends of Poisoning.						
<b>09. Course Outcomes (COs):</b>						
Upon successful completion of this course, the student will be able to: <b>CO1.</b> The concept and Significance of Forensic Toxicology. <b>CO2.</b> General study of Poisons and their analysis <b>CO3.</b> Extraction and isolation of organic and inorganic poisons.						
<b>10. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures =</b>	<b>Title of the unit: General Forensic Chemistry</b>				
Definition, Important cases associated with Forensic chemistry, Types of cases which require chemical analysis, Presumptive and confirmatory testing of chemical evidences. Scientific Principles and Instrumentation and Equipments involving analysis of chemical evidences: Early Analytical Techniques: Wet Chemistry, Chemistry of Color, Thin-Layer Chromatography Development of Instrumental Techniques Microscopy, Hyphenated Instruments: Separation and Detection, Spectrophotometry.						
<b>Unit – 2</b>	<b>Number of lectures =</b>	<b>Title of the unit: Drugs of Abuse</b>				
Introduction and classification of Drugs of Abuse (Narcotics, Stimulants, Depressant and hallucinogens), Status of Drug abused in India, Introduction to Club drugs and Drug abuse in Sports, Drugs as Evidence. Introduction and brief analysis of Phenolphthalein in Trap case, Petroleum adulteration. Illicit liquors and Arson and						

Explosives.		
<b>Unit-3</b>	<b>Number of lectures =</b>	<b>Title of the unit:</b> Sampling of chemical evidence.
Sampling of chemical evidence. Types of forensic cases which require chemical analysis. Types of analysis. Arson; Searching the fire scene. Collection and preservation of arson evidence. Scientific investigation and evaluation of clue materials		
<b>Unit –4</b>	<b>Number of lectures =</b>	<b>Title of the unit:</b> Explosives
Classification of explosives. Explosion process. Blast waves. Searching the scene of explosion. Post blast residue collection and analysis. Blast injuries. Detection of hidden explosives. Adulteration of petroleum products. Detective dyes; Analysis of phenolphthalein in trap cases.		
<b>11. Brief Description of self learning / E-learning component</b>		
1. <a href="https://www.slideshare.net/joulyn/forensic-toxicology-an-introduction">https://www.slideshare.net/joulyn/forensic-toxicology-an-introduction</a> 2. <a href="https://www.robsonforensic.com/practice-areas/alcohol-drug-abuse-expert">https://www.robsonforensic.com/practice-areas/alcohol-drug-abuse-expert</a> 3. <a href="https://www.cranfield.ac.uk/Courses/Short/Defence-and-Security/Forensic-Investigation-of-Explosives-and-Explosive-Devices">https://www.cranfield.ac.uk/Courses/Short/Defence-and-Security/Forensic-Investigation-of-Explosives-and-Explosive-Devices</a>		
<b>12. Books Recommended</b>		
1. Modi's (1988) Medical Jurisprudence & Toxicology, M. M. Trirathi Press Ltd. Allahabad, 2. Saferstein, R (1982) Forensic Science Hand Book, Vol I, II and III, Pretince Hall, NI. 3. Saferstein, R (2000) Criminalistics. 4. Curry (1986) Analytical Methods in Human Toxicology, Part II. 5. Curry, A.S. (1976) Poison Detection in Human Organs. 6. Mathew E. Johll (2009) Investigating Chemistry: A Forensic Science Perspective 7. Suzanne Bell (2009) Drugs, Poisons, and Chemistry 8. DFS Manuals of Forensic Chemistry and Narcotics.		

**PAPER-II**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>FORENSIC TOXICOLOGY</b>			<b>L</b>	<b>T</b>	<b>P</b>
<b>03. Course Code</b>	17110227			2	0	0
<b>04. Type of Course (use tick mark)</b>	<b>Core (□)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>	
<b>05. Pre-requisite (if any)</b>		<b>06. Frequency (use tick marks)</b>	Even ()	Odd (□)	Either Sem ()	Every Sem ()
<b>07. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>08. Course Description:</b>						
This core paper in Forensic Sciences, help to understand the Scientific Principles and Instrumentation, Introduction and classification of Drugs of Abuse, Role of the Forensic Toxicologists, and Classification of poisons based on their origin and Chemical nature, mode of action. Types and Trends of Poisoning.						
<b>09. Course Outcomes (COs):</b>						
Upon successful completion of this course, the student will be able to: <b>CO1.</b> The concept and Significance of Forensic Toxicology. <b>CO2.</b> General study of Poisons and their analysis <b>CO3.</b> Extraction and isolation of organic and inorganic poisons.						
<b>10. Unit wise detailed content</b>						
<b>Unit – 1</b>	<b>Number of lectures =</b>	<b>Title of the unit:</b> Introduction to Forensic Toxicology				
Forensic Toxicology Significance of toxicological findings. Techniques used in toxicology. Poisons. Classification of poisons. Physio-chemical and mode of action of poisons. Accidental, suicidal and homicidal poisonings. Collection and preservation of viscera, blood and urine for various poison cases. Metabolism and excretion of poisons.						
<b>Unit – 2</b>	<b>Number of lectures =</b>	<b>Title of the unit:</b> Drugs of Abuse				
Drugs of Abuse: Natural and synthetic drugs of abuse. Drug dependence. Classification of drugs of abuse: Narcotics, hallucinogens, depressants, stimulants and anabolic steroids. Field and laboratory tests of drugs of abuse. Instrumental methods of drug analysis; Collection and preservation of drug evidence.						
<b>Unit – 3</b>	<b>Number of</b>	<b>Title of the unit: Forensic Toxicology</b>				



	<b>lectures =</b>	
Definition, Areas of Forensic Toxicology, Elements of Forensic Toxicology, Nature of cases, Role of the Forensic Toxicologists, Instrumentation and equipments, Laws related to Forensic Toxicology.		
<b>Unit – 4</b>	<b>Number of lectures =</b>	<b>Title of the unit: Poisons</b>
Definition of Poison, Toxin and Toxicant, Ideal Poison, Classification of poisons based on their origin and Chemical nature, mode of action. Types and Trends of Poisoning: Animals and Human poisoning in India with special reference to Suicidal, Homicidal and accidental poisons, Major vesicants used as chemical-warfare agents. Factors affecting the poisoning, methods of administration. Extraction methods of some important poisons and their forensic identification.		
<b>11. Brief Description of self learning / E-learning component</b>		
1. <a href="https://link.springer.com/journal/11419">https://link.springer.com/journal/11419</a> 2. <a href="http://www.iosrjournals.org/iosr-jdms/papers/Vol16-issue9/Version-7/C1609071118.pdf">http://www.iosrjournals.org/iosr-jdms/papers/Vol16-issue9/Version-7/C1609071118.pdf</a> 3. <a href="https://www.sciencedirect.com/science/article/pii/S0160412016300642">https://www.sciencedirect.com/science/article/pii/S0160412016300642</a>		
<b>12. Books Recommended</b>		
1. Modi's (1988) Medical Jurisprudence & Toxicology, M. M. Trirathi Press Ltd. Allahabd., 2. Saferstein, R (1982) Forensic Science Hand Book, Vol I, II and III, Pretince Hall, NI. 3. Saferstein, R (2000) Criminalistics. 4. Curry (1986) Analytical Methods in Human Toxicology, Part II. 5. Curry, A.S. (1976) Poison Detection in Human Organs. 6. Mathew E. Johll (2009) Investigating Chemistry: A Forensic Science Perspective 7. Suzanne Bell (2009) Drugs, Poisons, and Chemistry 8. DFS Manuals of Forensic Chemistry and Narcotics.		

**PAPER-III**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>ANALYTICAL TECHNIQUES IN FORENSIC CHEMISTRY AND TOXICOLOGY</b>	<b>L</b>	<b>T</b>	<b>P</b>		
<b>03. Course Code</b>	<b>17110228</b>	2	0	0		
<b>04. Type of Course (use tick mark)</b>	<b>Core (☐)</b>	<b>DSE ()</b>	<b>AEC ()</b>	<b>SEC ()</b>	<b>OE ()</b>	
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd (☐)	Either Sem ()	Every Sem ()
<b>07. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures = 52</b>		<b>Tutorials = Nil</b>		<b>Practical = Nil</b>		
<b>08. Course Description:</b>						
Student will able to know about the Chemistry and Forensic examination of Phenolphthalein, cosmetics of forensic interest, Dyes, Pigments & Polymers. Analysis of chemical fertilizers and Corrosive chemicals in Forensic Investigations.						
<b>09. Course Outcomes (COs):</b>						
<b>CO1.</b> Student will able to demonstrate problem-solving and critical-thinking skills so as to knowledgeably discuss forensic chemical principles in their historic and current contexts. <b>CO2</b> Student will able to review the existing scientific literature and critically assess merit, novelty, and validity of scientific papers. <b>CO3.</b> Student will able to apply modern methods of forensic analysis in a laboratory setting. <b>CO4.</b> Student will able to design appropriate experiments to obtain meaningful results in a safe and environmentally sensitive manner.						
<b>10. Unit wise detailed content</b>						
<b>Unit-1</b>	<b>Number of lectures</b> =	<b>Title of the unit: Phenolphthalein</b>				
Chemistry and Forensic examination of Phenolphthalein used in Bribe trap cases, and related legal issues. Cosmetics: Introduction to cosmetics of forensic interest and their role in crime investigation, General Chemistry of Colorants, Dyes, Pigments & Polymers. Industrial Products: Physical and chemical examination of adulterated and non-adulterated oils and fats, Analysis of chemical fertilizers, consumer items such as gold, silver, tobacco, tea, sugar, salts. Corrosive chemicals: Hydrochloric acid, sulphuric acid, and nitric acid and alkalis' in crime exhibits of acid/alkali throwing cases.						
<b>Unit – 2</b>	<b>Number of lectures</b> =	<b>Title of the unit: Liquors</b>				
Definition, classification of liquors based on origin (Indian Made Foreign Liquors, Country Made Liquors and						

<p>Illicit Liquors), Fermented and Distilled methods (Pot Still and Continuous Still), Characteristics of Beer, wines and Whisky, Congeners in alcoholic beverages, Laws and penalties as per Excise/ Act. Laboratory methods of determination alcoholic strength, Forensic analysis of distilled and fermented liquors including illicit liquors.</p>		
<b>Unit – 3</b>	<b>Number of lectures</b> =	<b>Title of the unit:</b> Animal Poisons
<p>Insects and animal toxins and their examination, Composition of Snake venoms, Sites and mode of action, Effect on the body as a whole, and tests for identifications. Plant poisons: Classification and characteristics, method of extraction and stripping of plant poisons in matrices and analysis by chemical and instrumental techniques. Gaseous Poisoning: Carbon Monoxide, Hydrogen Cyanide and Phosphate gases, significance, signs and symptoms, methods of diagnosis, tests for identification. Food Poisoning: What is food poisoning, Food poisoning due to chemical and bacterial, Sign and symptoms of food poisoning, collection and preservation of evidence material, extraction and isolation, from food material, Biological material, detection and identification by colour test and Instrumental techniques.</p>		
<b>Unit – 4</b>	<b>Number of lectures</b> =	<b>Title of the unit:</b> Alcohol Intoxication
<p>Related cases, Properties and types of Alcohols, Pharmacology, Toxic properties and effects of alcohol. Chemical tests for alcohol in blood and urine including Breath Alcohol Screening devices, Method of analysis of some alcoholic beverages in biological materials by chemical methods (Kozelka-hine) and instrumental methods (GC), Legal context to drinking and driving. Immunoassay: Basic principles of immunoassay, Techniques: Enzyme/ Radioimmunoassay/Fluorescence immunoassay, Application of Immunoassay in Forensic Toxicology. Format of Report Writing &amp; Court Room Testimony: Information required by the Forensic toxicologist, Presenting findings in a Report format.</p>		
<p><b>11. Brief Description of self learning / E-learning component</b></p>		
<ol style="list-style-type: none"> <li>1. <a href="https://www.youtube.com/watch?v=qdmKGskCyh8">https://www.youtube.com/watch?v=qdmKGskCyh8</a></li> <li>2. <a href="https://www.youtube.com/watch?v=DKEQdU24eJA">https://www.youtube.com/watch?v=DKEQdU24eJA</a></li> <li>3. <a href="https://www.youtube.com/watch?v=T6rPzQVTCZQ">https://www.youtube.com/watch?v=T6rPzQVTCZQ</a></li> <li>4. <a href="https://www.youtube.com/watch?v=HwD1UEUOixI">https://www.youtube.com/watch?v=HwD1UEUOixI</a></li> </ol>		
<p><b>12. Books Recommended</b></p>		
<ol style="list-style-type: none"> <li>1. Modi's (1988) Medical Jurisprudence &amp; Toxicology, M. M. Trirathi Press Ltd. Allahabd,.</li> <li>2. Saferstein, R (1982) Forensic Science Hand Book, Vol I, II and III, Pretince Hall, NI.</li> <li>3. Saferstein, R (2000) Criminalistics.</li> <li>4. Curry (1986) Analytical Methods in Human Toxicology, Part II.</li> <li>5. Curry, A.S. (1976) Poison Detection in Human Organs.</li> <li>6. Mathew E. Johll (2009) Investigating Chemistry: A Forensic Science Perspective</li> <li>7. Suzanne Bell (2009) Drugs, Poisons, and Chemistry</li> <li>8. DFS Manuals of Forensic Chemistry and Narcotics.</li> <li>9. A Naquest (1984) legal chemistry. a guide to the detection of poisons, examination of tea, stains, etc</li> </ol>		

**PAPER IV (17110229) - PRACTICALS**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>Practical II</b>		<b>L</b>	<b>T</b>	<b>P</b>	
<b>03. Course Code</b>	<b>17110229</b>		0	0		11
<b>04. Type of Course (use tick mark)</b>		<b>Core (☐)</b>	<b>DSE ( )</b>	<b>AEC ( )</b>	<b>SEC ( )</b>	<b>OE ( )</b>
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ( )	Odd (☐)	Either Sem ( )	Every Sem ( )
<b>06. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures = Nil</b>		<b>Tutorials = Nil</b>		<b>Practical = 11</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to –						
CO1: Conduct Presumptive Drug Testing by using various methods.						
CO2: Extract and analyse different categories of poisons from viscera						
CO3: Detect metallic poisons by using Reinsch Test.						
CO4: Perform Field test for narcotic drugs.						
<b>Practicals:</b>						
<ol style="list-style-type: none"> <li>1. Simulated Crime Scene Exercise on:</li> <li>2. Field test for narcotic drugs.</li> <li>3. TLC separation of pesticides/insecticides &amp; Identification using chromomeric reagents</li> <li>4. Lab testing of Aluminum Phosphide (Phosphine gas)</li> <li>5. Identification of Gaseous Poisoning (Carbon Monoxide and HCN)</li> <li>6. Detection of metallic poisons using Reinsch Test.</li> <li>7. Extraction and analysis of different categories of poisons from viscera.</li> <li>8. Estimation alcohol in Blood.</li> <li>9. Microscopic Identification of some plant poisons.</li> <li>10. Analysis of viscera and food material for in case of food poisoning by chemical microscopic and instrumental techniques.</li> <li>11. 10. Qualitative Descriptions of Toxicity Exposure Limits Determination of LD50 and ED50, Units in Toxicology.</li> </ol>						
<b>11. Brief Description of self learning / E-learning component</b>						
<b>12. Books Recommended</b>						

**PAPER V (17110230) - SEMINAR AND ASSIGNMENTS**

<b>01. Name of the Department: Forensic Sciences</b>						
<b>02. Course Name</b>	<b>Assignments &amp; Seminars</b>			<b>L</b>	<b>T</b>	<b>P</b>
<b>03. Course Code</b>	<b>17110230</b>			0	2	0
<b>04. Type of Course (use tick mark)</b>		<b>Core</b> ( <input type="checkbox"/> )	<b>DSE</b> ()	<b>AEC</b> ()	<b>SEC</b> ()	<b>OE</b> ()
<b>05. Pre-requisite (if any)</b>		<b>6. Frequency (use tick marks)</b>	Even ()	Odd ( <input type="checkbox"/> )	Either Sem ()	Every Sem ()
<b>06. Total Number of Lectures, Tutorials, Practicals</b>						
<b>Lectures =</b>		<b>Tutorials = 02</b>		<b>Practical = Nil</b>		
<b>08. Course Outcomes (COs):</b>						
The students will able to –						
<b>CO1:</b> Enhance the Communication skills and thorough knowledge on particular topics.						
<b>CO2:</b> Work and preparation on Assignments based on case studies.						

