

Department of Criminology & Forensic Science
Dr. Harisingh Gour Vishwavidyalaya, Sagar

Objectives and Learning Outcomes of B.Sc. Forensic Science
Ist Semester

Paper Name and Code	Course Objective	Course Outcomes
Introduction to Forensic Science & Criminalities FSC:CC-111	The major objective of this paper is to enhance the skill in fundamental of forensic science, the importance of different types of evidence found at a crime scene and their examination to solve a crime.	Upon successful completion of the course, the students will learn about: 1. The basic concept of forensic science and organizational setup of forensic science laboratories in India. 2. Methods of securing, searching and documenting the scene of crime. 3. How different types of physical evidences are collected, packed, labeled and forwarded from scene of crime to forensic science laboratories. 4. The importance of physical evidence in criminal investigation. 5. The significance of toxicological and biological evidence in criminal investigation.
Forensic Science (Practical) FSC: CC – 112	The objective of this paper is to have practical knowledge about basic steps of crime scene investigation and preliminary examinations of different evidences.	After completion of the practical students will know about: 1. Collection, packing, labelling and forwarding of different physical evidences to forensic science laboratories. 2. Basic crime scene investigation steps. 3. The preliminary examination of arson, toxicological, blood and vitriolage related exhibits.

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IInd Semester

Paper Name and Code	Course Objective	Course Outcomes
Police Science & Criminal Justice System FSC:CC-211	The objective of this paper is to gain knowledge about basic forensic science in India, Police system, Criminology and Indian justice system.	After studying this paper students will know the following: 1. Organizational, hierarchical set of FSL & CFSL and learn about GEQD, DSSB and mobile forensic unit. 2. Learn about police forces, central institution, intelligence institutions and international perspective of forensic science. 3. Gain knowledge in criminology and police investigation procedure 4. Study civil, criminal cases and court system with basic knowledge of fundamental rights, IPC and IEA.
Forensic Science(Practical) FSC:CC-212	The objective of this paper is to have practical knowledge about crime scene preservation, different search methods sketching and reconstructive of different crime scenes.	After completion of the practical students will know about: 1. Crime scene preservation by sketching and photography. 2. Search methods used in outdoor, indoor and mobile crime scene. 3. Sketching of outdoor crime scene 4. Sketching of indoor crime scene. 5. Crime scene reconstruction methods.

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Objectives and Learning Outcomes of B.Sc. Forensic Science
IIIrd Semester

Paper Name and Code	Course Objective	Course Outcomes
Instrumental Techniques in Forensic Science FSC:CC-311	The objective of this paper is to provide knowledge about concept of analytical chemistry, electrophoresis and microscopy.	After studying this paper the students will know the followings- 1. The preparation of samples, their qualitative and quantitative analysis and data handling. 2. The basic principle of instrumentation and working of spectroscopic techniques. 3. The basics of chromatographic techniques and their applications. 4. Electrophoretic method and microscopy to analyze the forensic exhibits which may facilitates to start small scale start-up.
Forensic Science (Practical) FSC:CC-312	The objective of this practical paper is to provide understanding about concept of analysis of trace evidences, extraction of sample and chromatographic analysis.	After studying this paper the students will know the followings- 1. The trace analysis of cation and anion in physical evidences obtained from the crime scene. 2. Different extraction techniques for forensic exhibit analysis. 3. The basic principle and working of spectroscopic and chromatographic technique that could lead to professional job opportunities in testing laboratories.
Finger Prints and Questioned Document FSC:SEC-311	Questioned Documents, Finger prints and Cyber Forensics is one of the core subjects of Forensic Science where Questioned documents would educate you about different types of Questioned documents and forgeries and their respective examination and analysis. The subject would also orient	After the completion of the course the student/learner would be able to understand 1. The importance of fingerprints for identification purpose. 2. Different types of fingerprints and their development methods.

	you about the knowledge and identification of Fingerprints whereas the cyber Forensics aims to study the identification, collection, preservation and analysis of computer/digital evidences for court room purposes.	3. Characteristic features of signature and handwriting identification. 4. The detailed procedure of cyber forensics.
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Objectives and Learning Outcomes of B.Sc. Forensic Science
IVth Semester

Paper Name and Code	Course Objective	Course Outcomes
Introduction to Forensic Chemistry & Forensic Biology FSC:CC-411	The objective of this paper is to understand basic concept of forensic chemistry and biology and analysis of forensic exhibits.	After studying this paper the students will know the followings- 1. Analysis of different beverages for determination of adulteration and quality control check for petroleum products. 2. About basics of drugs and their classifications. 3. How foods got adulterated and methods of their examination. 4. Nature and importance of cells in human body and different biological material and their examination.
Forensic Science (Practical) FSC-CC-412	The objective of this paper is to have practical knowledge about plant poison, pesticide, blood & blood group, saliva, hair, fibres and pollens.	After completion of the practical students will know about: 1. Non-volatile plant poison extraction. 2. Separation of pesticide by TLC. 3. Drug extraction & identification by HPLC. 4. Blood/ blood group examination. 5. Origin of species by hair samples. 6. Identification of fibres by physical & chemical method. 7. Microscopic examination of pollen.
Crime Scene Management FSC:SEC-411	The major objective of this paper is to enhance the skill in complete management of crime scene like documentation, collection of and preservation of evidence, different searching method of evidence and role played by investigating officer during crime scene management.	Upon successful completion of the course, the student will be able to understand: 1. The basic concept of crime scene investigation and its management. 2. The legal procedures to make decisions related to investigative techniques. 3. The analysis of evidence, and courtroom testimony. 4. Develop their ability to conduct interviews and interrogations.

		5. Will get skill in proper documentation of evidence and crime scene for further use in courtroom testimony.
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Objectives and Learning Outcomes of B.Sc. Forensic Science
Vth Semester

Paper Name and Code	Course Objective	Course Outcomes
Forensic Toxicology FSC: DSE - 511	The objective of this paper is to gain knowledge about forensic toxicology, procedures for extraction, isolation & clean up and general studies & analysis of different drugs, alcohol & poisons.	After studying this paper students will know the following: 1. Basic knowledge about forensic toxicology with poison classification, types, signs & symptoms and modes of action. 2. Different extraction methods for non-volatile, volatile & toxic cations and anions. 3. Basic study and analysis of drugs, insecticides animal poisons, vegetable poisons, alcohol & metallic poisons.
Forensic Toxicology (Practical) FSC – EC - 512	The objective of the course is to give practical knowledge about anatomy of poisonous plant, about vegetable poison, insecticide, pesticide and drug of abuse and examination of metallic poisons.	After completion of the course the students will have practical knowledge about: 1. Anatomy of poisonous plant Cannabis, Datura, Nux-Vomica, Marking Nut etc. 2. Identification of vegetable poisons, 3. Extraction of pesticide and insecticides by LLE. 4. Identification of drug of abuse by HPLC. 5. Examination of metallic poisons like arsenic, lead etc.
Emerging Trends in Forensic Science FSC – DSE - 513	The objective of the course is to give knowledge about the Emerging Trends & Emerging Techniques in the field of forensic Science.	After completion of the course the students will have basic knowledge about: 1. Polygraph, Narco-analysis and brain fingerprinting. 2. DNA profiling and its importance in criminal justice system. 3. Basics of voice identification their characteristics and examination. 4. Identification and examination of evidences related to wildlife Forensics.

		5. Basics and application of chromatographic Techniques
Forensic Science (Practical) FSC – DSE - 514	The objective of the course is to give practical knowledge about electrophoresis amino acids and proteins, sample preparation and handling of PCR, VSC, chromatographic techniques like: GC-MS, LC-MS and HPTLC.	After completion of the course the students will have practical knowledge about the following 1. Sample preparation for different instruments. 2. Working and handling of Electrophoresis of amino acids and proteins. 3. Working and handling of PCR and VSC. 4. Sample preparation and handling of GC-MS, LC-MS and HPTLC.
Chromatography FSC: SEC -511	The objective of this paper is to gain knowledge about basic chromatography, theory and sample handling, different theories and types of chromatography.	After studying this paper students will know the following; 1. Basics of chromatography, origin, classification and principles. 2. Different theories of chromatography 3. Different types of chromatography 4. Basics of hyphenated chromatography, Ion exchange and gel permeation and affinity chromatography.

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Objectives and Learning Outcomes of B.Sc. Forensic Science
VIth Semester

Paper Name and Code	Course Objective	Course Outcomes
Forensic Physics & Ballistics FSC:DSE-611	Forensic Physics is the application of physics for the examination of different physical evidences for court room purposes whereas ballistics aims to impart specific knowledge of firearms and projectiles and their related phenomenon for solving shooting incidences. Photography is an indispensable tool used for the documentation of different aspects of crime scene.	After the completion of the course the student/learner would be able to understand 1. The firearms and their projectiles 2. Different field of ballistics which include Internal Ballistics, External and Terminal ballistics 3. Methods of investigation in shooting cases. 4. The importance and methods of photography for recording of crime scene 5. The statistics to collect the data, analysis of data and how to effectively present the results
Forensic Science (Practical) FSC – EC - 612	The objective of the course is to give practical knowledge about trace evidences like dust, soil, glass etc. and basic knowledge of techniques used to compare them.	After completion of the course the students will have practical knowledge about: 1. Density gradient method for matching soil, glass. 2. Glass fractures and refractive index of glass. 3. Chemical treatment of erased tool marks. 4. Lifting and casting of footmarks, tyre marks. 5. Handling of comparison microscope.
Forensic Medicine & Serology FSC:DSE-613	The major objective of this paper is to enhance the skill in forensic biology for the analysis of different kinds of biological evidences found at a crime	After the completion of the course the student/learner would be able to understand

	scene and the importance of forensic medicine in forensic investigation.	1. Importance of biological fluids and other serological evidences in criminal investigations. 2. The basic principle of DNA analysis and forensic significance of DNA typing. 3. The presentation of evidence in court and procedure of trials in court. 4. About post mortem changes and different type of wounds.
Forensic Medicine & Serology (Practical) FSC – EC -614	The objective of the course is to give practical knowledge about biological evidences like blood, bones, hairs and their use for purpose of justice.	After completion of the course the students will have practical knowledge about: 1. Human skeleton, hair, blood semen etc. 2. Determination of age and sex from long bones and skull. 3. Recording of bite marks. 4. Microscopic examination of blood, semen, fur and feather.
Computer Forensics & Cyber Security FSC:SEC-611	Computer Forensics aims to study the identification, collection, preservation and analysis of computer/digital evidences for court room purposes where Cyber security aims to impart information about the protection of computer systems and networks from harm, theft and unauthorized use.	After the completion of the course the student/learner would be able to understand 1. The importance of computer forensics and cyber security for the investigation purpose. 2. The detailed procedure of collection, preservation, examination, analysis of various digital evidences and finally the presentation of opinion in court. 3. The purpose of cyber security and what are the different measures to protect computers, networks and software programs from various cyber-attacks.

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Forensic Science investigation and Criminal Justice System: Theory FSC-CC-121	The major objective of this paper is to build knowledge on basic concept of forensic science, crime, criminal theories, criminal investigation, management of crime scene and collection & packaging of different types of evidence and certain laws related to crimes in India.	Upon successful completion of the course, the students will be able to understand: 1. The fundamental principles and functions of forensic science and its significance to human society. 2. The art of collecting, packaging and preserving different types of physical and trace evidence at crime scenes. 3. The importance of chain of custody. 4. Different types of crime scene. 5. Various tools and techniques for analysis of different types of crime scene evidence and their processing in courts.
Crime scene investigation (Theory) FSC:CC-122	The objective of this paper is to have practical knowledge about demonstration, photography of scene of crime, methods for searching of physical evidences, sketching and reconstruction of crime scene	After studying this paper students will know the following: 1. Crime scene management and photography. 2. Different searching methods of crime scene. 3. Different methods of crime scene sketching. 4. Collection, packing, labelling and forwarding of physical evidence from crime scene to forensic science laboratory. 5. Methods of crime scene reconstruction.
Forensic Physics, Ballistics, Photography and Statistics: Theory FSC-CC-123	Forensic Physics is the application of physics for the examination of different physical evidences whereas ballistics aims to impart specific knowledge of firearms and projectiles and their related phenomenon for solving shooting incidences. Photography	After the completion of the course the student/learner would be able to understand about: 1. The firearms and projectiles. 2. Different fields of ballistics 3. Methods of investigation in shooting cases. 4. The importance and methods of

	is an indispensable tool used for the documentation of different aspects of crime scene and Statistics is a broad discipline that concerns the analysis interpretation and presentation of data.	photography for recording of crime scene. 5. The statistics to collect and analyses of data and how to effectively present the results.
Forensic Physics and Ballistics (Practical) FSC:CC -124	The objective of this paper is to have practical knowledge about identification & matching of dust/soil sample, cloth sample, glass fracture, restoration, foot wear impressions, tool marks and bullet, shot and pellet identification.	After studying this paper students will know the following: 1. Dust / soil sample identification by physical method. 2. Physical matching of cloth sample, glass fracture identification. 3. Refractive index measurement of glass. 4. Restoration of erased and obliterated marks by chemical methods. 5. Lifting and casting of tyre/foot wear impression. 6. Comparison of tool marks & fired cartridge/bullets and shot, pellets identification.
Instrumental Methods – Physical: Theory FSC-CC-125	The objective of this paper is to provide knowledge about concept of analytical chemistry.	After studying this paper the students will know the followings- 1. The handling and preparation of samples. 2. Qualitative and quantitative analysis of different analytes and matrix. 3. Basic principle and working of spectroscopic technique that could lead to professional job opportunities in testing laboratories. 4. The electrochemical methods, colorimetry, voltammetry which may facilitates to start small scale start-ups.
Instrumental Methods – Physical: Practical FSC-CC-126	The objective of this practical paper is to provide knowledge about concept of analytical chemistry.	After studying this paper the students will know the followings- 1. Different sample preparation techniques. 2. Qualitative and quantitative analysis of different analytes. 3. Handling and operation of UV spectroscopy. 4. Handling and operating of FTIR spectroscopy. 5. Working of other spectroscopic techniques.

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Instrumental Methods – Chemical: Theory FSC-CC-221	The objective of this paper is to understand the basic concept of separation and sample extraction from various matrices.	After studying this paper the students will know the followings- 1. The sample handling and solvent extraction techniques. 2. The basic principle and working of chromatographic technique that could lead to professional job opportunities in testing and pharmaceutical laboratories. 3. The basic principle and working of mass spectroscopy, electrophoresis technique and centrifugation methods.
Instrumental Methods – Chemical: Practical FSC-CC-222	The objective of this practical paper is to understand the basic concept of separation, and extraction of drug and pesticides from various matrices.	After studying this paper the students will know the followings- 1. The analysis and identification of plant alkaloids by TLC method. 2. Identification of dyes using TLC methods. 3. Analysis of pesticides substances in the forensic exhibits. 4. Working and handling of chromatographic techniques.
Forensic Chemistry and Explosives: Theory FSC-CC-223	The objective of this paper is to understand basic concept of analytical forensic, measurement, good laboratory practices and forensic exhibits analysis.	After studying this paper the students will know about- 1. The drugs and their psychological and physical dependence. 2. Proper collection and preservation of drug evidence and advance analytical techniques used in their examination. 3. Types of hazards, fire and explosion, elements of safety programme and risk

		management. 4. Good laboratory practices, quality control, quality assurance, various agencies of quality control, laboratory management.
Forensic Chemistry (Practical) FSC-CC-224	The objective of this paper is to have practical knowledge about trap cases, acid attack cases, petroleum products, cement, illicit liquor, components of crackers and black powder.	After completion of the practical students will know about: 1. Chemicals used in trap cases and acid attack. 2. Analysis and examination of petroleum products. 3. Adulterants in cement sample. 4. Percentage of proof of spirit in illicit liquor and examination of country made liquor. 5. Examination of crackers & black powder.
Forensic Toxicology and Pharmacology: Theory FSC-CC-225	The major objective of this paper is to build knowledge on classification, examination and analysis of poison, drugs and alcohol and their absorption in humans. To get complete knowledge about the cleaning, isolation and extraction of poison from viscera.	Course Learning Outcomes: Upon successful completion of the course, the student will be able to: 1. Explain the significance of toxicological studies in forensic science. 2. The classification of poisons and their modes of actions. 3. Different methods of extraction, isolation and clean-up of various types of poison encountered in poisoning cases. 4. Attain skills in the forensic identification of illicit liquors. 5. Comprehend and evaluate the main pharmacological effects of alcohol and common illicit drugs with the emphasis on their effects on humans.
Forensic Toxicology (Practical) FSC-CC-226	The objective of this paper is to have practical knowledge about identification of common plants, vegetable poisons, extraction identification insecticides, pesticides, drugs, metals and metallic poison from viscera	After studying this paper students will know the following: 1. Physical and colour test of common plants. 2. Identification of different vegetable poisons. 3. Extraction and identification of pesticides by colour test/TLC and drugs/toxicants from biological matrix. 4. Identification of salts and metals by spot test.

		5. Extraction and identification of metallic poisons.
Computer Forensics and Cyber Security: Theory FSC-OE-221	Computer Forensics aims to study the identification, collection, preservation and analysis of computer/digital evidences for court room purposes where Cyber security aims to impart information about the protection of computer systems and networks from harm, theft and unauthorized use.	After the completion of the course the student/learner would be able to understand: 1. The importance of fingerprints for identification purpose. 2. Different types of fingerprints development methods. 3. Characteristic features of signature and handwriting identification. 4. The detailed procedure of cyber forensics.

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Objectives and Learning Outcomes of M.Sc. Forensic Science
IIIrd Semester

Paper Name and Code	Course Objective	Course Outcomes
Forensic Biology and Serology: Theory FSC-CC-321	The major objective of this paper is to enhance the skill in fundamentals of forensic biology and serology, analysis of serological evidence and their further use forensic science to solve criminal cases.	Upon successful completion of the course, the students will be able to understand: 1. The basic concept of biology and its significance in forensic science. 2. How forensic entomology assists in death investigations. 3. Demonstrate the usefulness of genetic markers in forensic investigations. 4. Different techniques for DNA extraction
Forensic biology & serology (Practical) FSC-CC-322	The objective of this paper is to have practical knowledge about blood, semen, hair, fibre, saliva and plant species.	After completion of the practical students will know about: 1. Examination of blood/semen, salivary stains. 2. Examination of fibre. 3. Determination of blood groups. 4. Identify different plant species using external features.
Forensic Medicine and Medical Jurisprudence: Theory FSC-CC-323	The major objective of this paper is to build knowledge on forensic medicine and the concepts of medical jurisprudence, personal identification, thanatology, autopsy, post mortem examination, examination of injuries and importance of forensic anthropology and forensic odontology in Forensic Science.	Upon successful completion of the course, the students will be able to know about: 1. The importance of personal identification in mass disaster cases. 2. The importance of autopsy. 3. Knowledge on different types of injury and wounds. 4. The different techniques of facial reconstruction and their forensic importance. 5. Importance of forensic odontology.
Forensic Medicine (Practical) FSC-CC-324	The objective of this paper is to have practical knowledge about bones of human body, age & sex of a person, bite marks, insects, pollen grains, diatoms, race & species and lip prints	After studying this paper students will know the following: 1. Identification of bones for human and animal origin. 2. Determination of age and sex of a person from long bones and skull. 3. Casting and photography of bite marks. 4. Collection and identification of Pollen

		grains and diatoms. 5. Race and species determination by blood grouping methods etc.
Computer forensics & cyber security (Theory) FSC-EC-321	The objective of this paper is to gain knowledge about fundamentals of a computer, computer forensics, Networking, cybercrime and cybercrime.	After studying this paper students will know the following: 1. Basics of computers, hardware, operating system and software. 2. Computer crimes definition, types, collection, handling and preservation of digital evidences. 3. Networking concepts and technology. 4. Cybercrimes definition, types, virus hacking, software piracy and intellectual property. 5. Concept of network security and cybercrime investigation.
Computer forensics & cyber security (Practical) FSC-EC-322	The objective of this paper is to have practical knowledge about computer, collection & handling, data security, IP address & software used for detection of cybercrime.	After studying this paper students will know the following: 1. Basics of computer, accessories & operating system. 2. Digital evidences collection & handling. 3. Detection of origin of e-mail. 4. Data & security protection. 5. Software used in detection of various types of cybercrime.
Dactylography & biometrics (Theory) FSC-EC -323	The objective of this paper is to gain knowledge about Fingerprint, development of fingerprint, biometrics & face recognition.	After studying this paper students will know the following: 1. Basics of fingerprint, history, patterns & classification. 2. Types pf fingerprint, location, development, photography & comparison 3. Ear biometrics and iris recognition. 4. Retina biometrics and face recognition
Dactylography & biometrics (Practical) FSC-EC -324	The objective of this paper is to have practical knowledge about fingerprint collection methods, pattern identification, fingerprint development & lifting, lip print and examination.	After studying this paper students will know the following: 1. Record fingerprint chart by direct print and rolling methods. 2. Identify fingerprint pattern and ridge counting and tracing by TransoScan. 3. Development of latent prints and their lifting. 4. Identification of chances prints on different surface.
Investigative tools & techniques (Theory) FSC-EC-325	The objective of this paper is to gain knowledge about detective methods, tools & techniques, surveillance &	After studying this paper students will know the following: 1. Basics knowledge about detective agencies in India.

	modern tools.	2. Basic tools and kits used by detectives. 3. Different detective techniques like interview, interrogation, face reading, tracking system. 4. Basics of surveillance and its importance. 5. Modern detective tools like spy equipment's, listening devices drones, bugging etc.
Elective: Forensic Neuroscience and Behavior: Theory FSC-EC-326	The objective of this paper is to know about the forensic neuroscience, a modern branch of forensic and its role in criminal investigation.	After studying this paper the students will understand about the following- 1. The pro-criminalistics approach in forensic science for the management of crime. 2. The involvement of various neurochemical markers in the regulation of an individual's behavior. 3. Basic principle of different brain imaging techniques. 4. Role of psychological techniques in the investigation of abnormal or criminal behaviour in an individual.
Questioned documents & their examination (Theory) FSC-EC-327	The objective of this paper is to gain knowledge about nature & scope, tools in questioned documents, comparison of handwriting and questioned documents & forgeries.	After studying this paper students will know the following: 1. Definition, types, collection, handling, preservation of questioned document. 2. Basic tools for forensic document examination. 3. Comparison, natural & fundamental divergences in handwriting. 4. Merits & demerits of exemplar and non-exemplar samples during comparison. 5. Alterations in documents, charred documents and examination.
Questioned documents & their examination (Practical) FSC-EC-328	The objective of this paper is to have practical knowledge about charred document, comparison of handwriting, signature & forged document, secret writing, currency and ink analysis.	After studying this paper students will know the following: 1. Collection, preservation, handling & forwarding of charred documents 2. Photographic comparison of handwriting & signature. 3. Comparison of forged & genuine document by VSC & other methods. 4. Examination of questioned document & currency by VSC. 5. Ink analysis by TLC.
Dactylography & biometrics (Theory) FSC-OE-321	The objective of this paper is to gain knowledge about Fingerprint, development of fingerprint,	After studying this paper students will know the following: 1. Basics of fingerprint, history, patterns & classification.

	biometrics & face recognition.	2. Types pf fingerprint, location, development, photography & comparison 3. Ear biometrics, iris recognition. 4. Retina biometrics & face recognition
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Objectives and Learning Outcomes of M.Sc. Forensic Science

IVth Semester

Paper Name and Code	Course Objective	Course Outcomes
Instrumental methods – Biological (Theory) FSC-CC-421	The objective of this paper is to gain knowledge about biological/chemical analysis, centrifugation techniques, enzyme techniques, electrophoresis & immunochemical techniques and molecular biology techniques.	After studying this paper students will know the following: 1. Basics of biological/ chemical analysis, 2. pH and its measurement. 3. Basic principles of sedimentation, types of centrifuges. 4. Enzyme kinetics, purification & protein estimation, enzyme assay techniques, immune chemical method. 5. Gel electrophoresis and its working. 6. Outline of genetic manipulation enzyme, introduction to microfluids.
Instrumental methods: Biology (Practical) FSC – CC - 422	The objective of this course is to develop an understanding of handling and working of instruments used for biological samples like PCR, Centrifuge, SEM, TEM etc.	After completion of course, the student will develop a practical understanding of working and handling of/ knowledge about: 1. Polymerase chain reaction instrument 2. Protein estimation of biological Sample. 3. Separation of cell organelles using centrifuge. 4. Gel Electrophoresis, SEM, TEM, UV spectrophotometer etc.
Questioned Documents, Finger prints and Cyber Forensic: Theory FSC-CC-423	Questioned Documents, Finger prints and Cyber Forensics is one of the core subjects of Forensic Science where questioned documents would educate you about different types of questioned documents and forgeries and their respective examination and analysis. The subject would also orient you about the knowledge and identification of Fingerprints whereas the cyber Forensics aims to study the identification, collection, preservation and analysis of computer/digital evidences for court room purposes.	After the completion of the course the student/learner would be able to understand: 1. The importance of fingerprints for identification purpose. 2. Different types of fingerprints and their development methods. 3. Would be able to understand characteristic features of signature and handwriting identification. 4. Detailed procedure of cyber forensics.
Questioned Documents, Fingerprints and Cyber Forensic (Practical) FSC – CC - 424	The objective of this course is to develop a practical understanding about concepts of examination of writing instruments, different types of writing, fingerprints and collection and handling of digital evidences.	After completion of course, the student will develop a practical knowledge about: 1. Examining of ink sample through paper chromatography. 2. Decipherment of various writing on different surfaces. 3. Preserving and handling charred

		documents. 4. Lifting and classifying different types of fingerprints. 5. Computer accessories, operating systems and handling of digital evidences.
Narcotics and drug of abuse (Theory) FSC – EC - 421	The objective of this course is to develop a comprehensive understanding of Narcotic drugs and Psychotropic Substances, about drug of abuse, pharmacology of drugs, general analysis and recent advancement in drugs.	After completion of course, the student will develop a fundamental knowledge about: 1. Narcotic drugs and Psychotropic Substances. 2. Types of drugs, their trafficking, dependency etc. 3. Absorption, distribution, metabolism of drugs inside the body. 4. General study about LSD, barbiturates, heroin etc. 5. Rave drugs, designer drugs and monitoring agencies.
Narcotics and drug of abuse (Practical) FSC – EC - 422	The objective of this course is to develop a practical knowledge of identification of common plant, extraction of drugs from blood, urine (Simulated samples), their separation using HPLC, examining them using UV-Vis Spectrophotometer.	After completion of course, the student will develop 1. A fundamental and practical knowledge about morphological features identification of Cannabis, Tobacco & Opium Poppy. 2. Preliminary examination of sexual assault drugs. 3. Extraction and identification of drug from urine, blood and viscera. 4. Extraction of alcohol from country made liquor. 5. Examination of drug of abuse by UV-Vis Spectrophotometer.
Emerging Trends in Forensic Science (Theory) FSC – EC - 423	The objective of this course is to develop a basic understanding of emerging trends and techniques in Forensic science.	After completion of course, the student will have a fundamental knowledge about: 1. Polygraph and Narco-analysis. 2. DNA profiling. 3. Voice Identification. 4. Forensic entomology. 5. Wildlife Forensics.
Forensic Anthropology (Theory) FSC – EC - 424	The objective of this course is to develop comprehensive knowledge about forensic anthropology, personal identification, forensic odontology and Bite Marks.	After completion of course, the student will have a comprehensive fundamental knowledge about: 1. Forensic anthropology and reconstruction of face and skull. 2. Different method of personal identification. 3. Portrait parle, superimposition technique. 4. Forensic odontology and bite marks.

Forensic Anthropology (Practical) FSC – EC - 425	The objective of this course is to develop practical knowledge about forensic anthropology, personal identification, blood grouping and Bite Marks.	After completion of course, the student will have a practical knowledge about: 1. Measurements of Facial indices. 2. Anthropometric measurements of upper limbs of human body. 3. Determination of sex from long bones and girdle Indices. 4. ABO blood grouping. 5. Recording and comparing bite marks using photography.
Chromatographic Techniques (Theory) FSC – EC - 426	The objective of this course is to develop comprehensive knowledge of chromatography and its theories, planer chromatography, columns chromatography and their sample preparations.	After completion of course, the student will have a comprehensive fundamental knowledge about: 1. History, basics and principles of chromatography. 2. Theories of chromatography. 3. Planer and column chromatographic techniques. 4. Columns chromatography: HPLC, UPLC, LC-MS, Gas Chromatography and their sample preparations.
Chromatographic Techniques (Practical) FSC – EC - 427	The objective of this course is to develop practical knowledge of chromatography and its theories, planer chromatography, columns chromatography, HPTLC.	After completion of course, the student will have a practical fundamental knowledge about: 1. Preparation of TLC using silica gel. 2. Analysis of inks by paper chromatography and TLC. 3. Separation of pharmaceutical, agrochemical compounds by TLC, HPLC. 4. Separation of dyes by HPTLC.
Project FSC-EC-428		

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Objectives and Learning Outcomes of Ph.D. Forensic Science

Paper Name and Code	Course Objective	Course Outcomes
Research Methodology: FSC – CC - 141	The objective of this course is to develop comprehensive knowledge of research and its significance, hypothesis, sample and data management, about literature survey and Research Proposal writing.	After completion of course, the students will have a comprehensive fundamental knowledge about: 1. Objective and significance of research. 2. Hypothesis and its errors. 3. Sampling methods and data management. 4. Literature surveys, impact factor, h – index. 5. Research proposal writing, reference format etc.
Forensic Science: FSC – CC -142	The objective of this course is to provide an insight in the subject of forensic Science starting from basic to the recent trends in the subject.	After completion of course, the students will have a comprehensive fundamental knowledge about: 1. Principle, scope, ethics in Forensic Science. 2. Physical evidences, medicine and jurisprudence. 3. General and emerging trends in forensic chemistry, toxicology, biology etc. 4. Idea about popular techniques like narco-analysis, voice analysis, DNA analysis & brain fingerprinting.
Research and publication ethics: FSC – CC - 144	The objective of this course is to provide fundamental knowledge about ethics related to research conduct and its publication.	After completion of course, the students will have a comprehensive fundamental knowledge about: 1. Definition, scope, branches of philosophy and ethics. 2. Ethical research and scientific misconducts. 3. Publication ethics, conflicts of interest, predatory publications and journals. 4. Open access publication and initiatives. 5. Databases and research metrics etc.
Chemistry and Toxicology (Elective): FSC – EC - 141	The objective of this course is to provide fundamental knowledge about forensic chemistry and toxicology and related instruments.	After completion of course, the students will have a comprehensive fundamental knowledge about: 1. Various drugs, their classification, separation.

		2. Examination & analysis of: opium, cannabis, stimulant drugs etc. 3. Poisons, its types, its action, extraction. 4. Chromatographic techniques e.g., TLC HPTLC, HPLC etc. 5. UV-Vis. Spectrophotometry, IR, FTIR, Mass Spectrometry etc.
Biology and Serology FSC-EC-142	The major objective of this paper is to enhance the skill in forensic biology to solve criminal cases, DNA examination, and detection of various botanical evidences.	Upon successful completion of the course, the students will learn about: 1. The classification, properties & detection of amino acids, carbohydrates, and proteins. 2. Basic concept of genetic and its importance in forensic science. 3. The importance of biological fluids in crime investigations. 4. Explain how forensic entomology assists in death investigation. 5. The basic principle of DNA analysis and also elucidate the role of DNA typing in parentage testing. 6. The examination of evidences like diatom and pollen grains in forensic investigation
Documents, Computer Forensics & Impression (Elective): FSC – EC - 143	The objective of this course is to provide fundamental knowledge about Computer forensic, Cyber security, Documentation, Fingerprints and other impressions.	After completion of course, the students will have a comprehensive fundamental knowledge about: 1. Computer forensic, cyber security, software. 2. Network security, multilayer security, intrusion triangle. 3. Documents, their types, their examination. 4. Fingerprints and other Impressions.
Review of Published Research Work FSC-CC-143	The objective of this course is to develop practical knowledge and aptitude of research reviewing.	In this course student have to make a review article of a topic which will be evaluated at the end of semester.