

**College of Paramedical Sciences
Teerthanker Mahaveer University**

B.Sc. (Forensic Sciences)

Programme Outcome

PO-1	:	Understanding ways of functioning effectively as an individual independently and as a member in diverse team in multidisciplinary settings (Attitude).
PO-2	:	Understanding requirements of continuous education as a function of growth and maintenance of professional competence (Lifelong learning).
PO-3	:	Understanding environmental consciousness and societal concerns in achieving sustainable development (Environment and Sustainability).
PO-4	:	Applying computer skills in health care system and taking entrepreneurial decisions (Entrepreneurship).
PO-5	:	Applying knowledge to assess societal, health, safety and legal issues related to Professional practice (Social interaction & effective citizenship).
PO-6	:	Applying systematized problem solving techniques to identify and correct procedural errors to verify the accuracy of laboratory result obtained.(Problem analysis and solving).
PO-7	:	Applying appropriate techniques, resources and tools with an understanding of limitations (Technology savvy/usage).
PO-8	:	Developing the ability towards ethical as well as critical thinking. (Critical thinking)
PO-9	:	Executing professional conduct and interpersonal communicational skills effectively with society at large (Communication).

Programme Specific Outcome

PSO-1	:	Understanding the concepts and tools and techniques of the Sciences (Chemistry, Physics, Biology, Psychology, Computer Science, statistics etc.) Related to Forensic Science and Criminal Justice system.
PSO-2	:	Understanding the Need and nature and different divisions of forensic Science, Crime and Criminal law and structural and functional organization of various crime agencies (CBI. INTERPOLE, RAW).
PSO-3	:	Understanding the different physical and chemical methods for the Analysis of different physical evidence at the various crime scenes.
PSO-4	:	Demonstrating analytical subject specific skills involving the principles, practices and techniques of specific field.
PSO-5	:	Applying major techniques for evidence collection and analysis at crime scene and selecting Appropriate technique.
PSO-6	:	Applying quality control, safety measures & maintenance procedure of laboratory equipment.

Course Outcomes

BFS-S-105	CO-1	Understanding the concepts, theories, models & techniques and rationale of training in Forensic Science
	CO-2	Discussing the definition, characteristics, classification of Crime, Crime scene and steps involved in Crime Scene and Criminal investigation
	CO-3	Identifying about professional and ethical responsibility of a Forensic Scientist.
	CO-4	Explaining the structural and functional levels of various divisions of forensic laboratory.
	CO-5	Applying the importance of Physical evidences at various Crime Scenes (homicide, suicide, and hanging, hit and run).
BFS-S-103	CO-1	Remembering the anatomy of plant and human skeletal system (including teeth), and morphology of leaves, flowers, stem and root so as to recognize them as biological evidence if present in various crime scenes.
	CO-2	Understanding the concept of biochemical structure and function of bio-molecules such as proteins, fat, nucleic acid, etc., to know their importance in individualization and identification of an individual.
	CO-3	Explaining the classification of angiosperms and gymnosperms and Explaining the mechanical and conducting tissue System of these plants.
	CO-4	Identifying the process of ossification, different types of bones, dental structure of humans, types of teeth and arrangement to apply the knowledge for identification of deceased and criminal investigation.
	CO-5	Describing the Classification of microorganisms and explaining the concept of pure culture and methods to control micro-organisms and their importance in Forensic microbiology.
BFS-S-106	CO-1	Remembering the basic knowledge about computer science
	CO-2	Understanding the concepts of number system.
	CO-3	Identifying the concepts and implementing logic gate.
	CO-4	Describing the structural and functional importance of different parts of operating system.
	CO-5	Analyzing the different OSI layer of computer network.
TMUGE101	CO-1	Remembering and understanding of the basic of English grammar and vocabulary.
	CO-2	Understanding of the basic Communication process.
	CO-3	Applying correct vocabulary and tenses in sentences construction.
	CO-4	Analyzing communication needs and developing communication strategies using both verbal & non-verbal method.
	CO-5	Drafting applications in correct format for common issues.
	CO-6	Developing self-confidence.
BFS-S-108	CO-1	Remembering the basic knowledge of Chemistry (Inorganic and organic Chemistry).
	CO-2	Understanding the concept of Bohr atomic models and quantum mechanical model of atom.
	CO-3	Identifying various methods of preparations of hydrocarbons.
	CO-4	Describing the classification of organic compounds & concept of organic reaction mechanism and isomerism.

	CO-5	Describing advanced symmetry concepts of chemical molecules and its applications.
BFS-S-109	CO-1	Remembering the basic knowledge of Physics.
	CO-2	Understanding The central concepts of quantum mechanics: wave functions, momentum and energy operator, the Schrodinger equation, time dependent and time independent cases,
	CO-3	Understanding The properties of nuclei like density, size, binding energy, nuclear forces and structure of atomic nucleus, liquid drop model and nuclear shell model and mass formula.
	CO-4	Understanding the probability density and the normalization techniques, and applying the knowledge for skill development on Problem solving e.g. one-dimensional rigid box, tunneling through potential barrier, step potential, rectangular barrier.
	CO-5	Understanding the concepts of nuclear fission and fission and Radioactivity.
BFS-S-205	CO-1	Knowing the fundamentals of law and its importance in any Criminal justice system.
	CO-2	Understanding the concepts of Civil and Criminal law and its relevance to Forensic Science.
	CO-3	Describing the concepts of some sections of IEA, IPC, and CrPC related with Forensic Science.
	CO-4	Identifying the structural and functional levels of various Crime Investigation agencies at National and International level.
	CO-5	Understanding the concept of Dowry Prohibition Act, Immoral Traffic Prevention Act, Wildlife Protection Act., and Environment Protection Act.
BFS-S-203	CO-1	Recalling the fundamental concept of physiological systems of human body and understanding their importance in crime investigations.
	CO-2	Understanding the concepts of immunology and their role in identification of an individual
	CO-3	Understanding the fundamental concept of Tissue system and their importance in crime scene investigations.
	CO-4	Applying the knowledge of the biochemical structure and function of DNA for individualization of human being.
	CO-5	Applying the principle and mechanics of various microscopes for using them to in visualize trace evidence and comparing it with control samples.
BFS-S-206	CO-1	Understanding the concept of digital forensics advance technology and its relevance in solving the cases related with cyber security issues.
	CO-2	Identifying the concept of Human Biometric system based on human biological distinct characteristics and applying the knowledge to solve the identity theft related cases.
	CO-3	Summarizing the different phases of incident response and its importance in maintaining network security.
	CO-4	Explaining the concept of cyber security tools and their relevance related with different forensic digital crimes.
	CO-5	Applying the concept of digital crime scene evidence collection and data retrieval methods for different cyber security crimes.
BFS-S-208	CO-1	Remembering the fundamental concept of Chemistry (Physical and

		organic Chemistry).
	CO-2	Understanding the laws of Thermodynamics.
	CO-3	Understanding the basic concept of Thermo chemistry.
	CO-4	Summarizing the different methods of preparation of aromatic hydrocarbon and aryl halides
	CO-5	Explaining the ionization of electrolytes and salt hydrolysis.
BFS-S-209	CO-1	Recognising the concept of simple harmonic motion and damped oscillator.
	CO-2	Recalling the frame of references and understanding fundamentals of special relativity.
	CO-3	Understanding the concept of relativity and implementing the knowledge for context of time dilation, length contraction, and relativistic addition of velocities.
	CO-4	Explaining the concept of Dynamics of rigid bodies and Moment of inertia.
	CO-5	Applying the concept of gravitation
TMUGE201	CO-1	Remembering & understanding the basics of English Grammar and Vocabulary
	CO-2	Understanding the basics of Listening, Speaking & Writing Skills
	CO-3	Understanding principles of letter drafting and various types of formats.
	CO-4	Applying correct vocabulary and grammar in sentence construction while writing and delivering presentations
	CO-5	Analyzing different types of listening, role of Audience & Locale in presentation
	CO-6	Creating Official Letters, E-Mail & Paragraphs in correct format.
BFS-S-303	CO-1	Remembering the composition of biological fluids – blood, urine, semen, saliva, sweat and milk and Applying for chemical and serological examination of samples.
	CO-2	Interpreting concepts of blood pattern and applying the knowledge of pattern analysis in solving Crime scene.
	CO-3	Understanding the hair and fiber morphology and analyzing that how this knowledge assists in death Investigations.
	CO-4	Applying the art of collecting, packaging and preserving different types of biological evidences and Applying this during the reconstruction of crime scene practical.
	CO-5	Analyzing the biological evidences such as blood , urine etc encountered in various crime scene
BFS-S-305	CO-1	Understanding the concept of Forensic Medicine & concept of inquest, oath and various court proceedings used in medico legal investigation.
	CO-2	Interpreting the concept of bimolecular changes after death and it's the Medico legal significance
	CO-3	Explaining the wounds and injuries their nature, classification and laws and differentiate the homicide, suicidal and accidental injuries.
	CO-4	Applying the Forensic anthropological & forensic odontological techniques to determine age, sex and race from skeletal remains.
	CO-5	Analyzing the different asphyxia death scenarios like hanging, strangulation and drowning through case study.
BFS-S-310	CO-1	Remembering the significance of cyber forensic investigation process and

		when to conduct it.
	CO-2	Understanding the various technical issues related with cyber forensic investigations
	CO-3	Explaining the Design and implementation of security policies using software and hardware tools.
	CO-4	Applying the tools, technique and algorithms of cryptography and its applications in cyber security.
	CO-5	Analysing the concept of cyber security and its potential network threats.
TMUGE301	CO-1	Remembering and understanding the English grammar and vocabulary.
	CO-2	Understanding the art of public speaking and strategies of reading comprehension.
	CO-3	Applying correct vocabulary and sentence construction during public speaking or professional writing.
	CO-4	Analyzing different types of sentences like simple, compound and complex. Drafting notice, agenda and minutes of the meeting.
	CO-5	Developing speaking skills during common conversation and power point presentation.
BFS-S-306	CO-1	Understanding basic concepts in the context of ecological and environmental sciences.
	CO-2	Interpreting the ideas about energy resources in today's scenario and discussing about alternate energy sources.
	CO-3	Classifying and describe biodiversity and also summarize biogeographically distribution of India.
	CO-4	Describing concepts and methods to apply in environmental communication and public awareness.
	CO-5	Interpreting the ethical and cultural conduct in environmental activities.
BFS-S-308	CO-1	Describing the basic concept of analytical chemistry. Qualitative and quantitative analysis.
	CO-2	Understanding the theoretical principles of various separation techniques in chromatography, and Explaining the applications of chromatographic techniques.
	CO-3	Applying the basic statistical treatment of the analytical data for getting a correct result.
	CO-4	Analyzing the chemical structure of water and soil.
	CO-5	Analyzing the chemical composition of cosmetics and their functions in different products.
BFS-S-309	CO-1	Understanding the relation between electric field and potential, exploiting the potential to solve a variety of problems, and relating it to the potential energy of a charge distribution.
	CO-2	Describing electric dipoles and the role of molecular dipoles in the electrostatic response of dielectrics. Demonstrating a working understanding of capacitors.
	CO-3	Identifying the Calculation of the magnetic forces that act on moving charges and the magnetic fields due to currents (Biot- Savart and Ampere laws)
	CO-4	Applying the Gauss's law of electrostatics to solve a variety of problems.
	CO-5	CO5 Applying the concepts of induction and self-induction, to solve

		problems using Faraday's and Lenz's laws
TMUGS-301	CO-1	Utilizing effective verbal and non-verbal communication techniques in formal and informal settings
	CO-2	Understanding and analyzing self and devising a strategy for self growth and development.
	CO-3	Adapting a positive mindset conducive for growth through optimism and constructive thinking.
	CO-4	Utilizing time in the most effective manner and avoiding procrastination.
	CO-5	Making appropriate and responsible decisions through various techniques like SWOT, Simulation and Decision Tree.
	CO-6	Formulating strategies of avoiding time wasters and preparing to-do list to manage priorities and achieve SMART goals.
BFS-S-403	CO-1	Remembering the morphology of arthropods and apply its use in estimating time since death under forensic Entomology.
	CO-2	Explaining the concept of wild life forensic, and evidences like pug marks , ivory and their significance in conserving natural resources
	CO-3	Examining the importance of various microorganisms responsible for cases like food poisoning and bioterrorism.
	CO-4	Identifying bird's flight mechanism and feather topography to avoid bird accidents and their illegal trading.
	CO-5	Applying the morphological features of botanical evidences like pollens, algae and diatoms useful in crime investigations.
BFS-S-411	CO-1	Remembering the morphology of arthropods and apply its use in estimating time since death under forensic Entomology.
	CO-2	Explaining the concept of wild life forensic, and evidences like pug marks , ivory and their significance in conserving natural resources
	CO-3	Examining the importance of various microorganisms responsible for cases like food poisoning and bioterrorism.
	CO-4	Identifying bird's flight mechanism and feather topography to avoid bird accidents and their illegal trading.
	CO-5	Applying the morphological features of botanical evidences like pollens, algae and diatoms useful in crime investigations.
BFS-S-405	CO-1	Understanding the fundamental principles of fingerprints on which forensic science is based.
	CO-2	Describing concept of classification and applying the cataloguing of fingerprint patterns.
	CO-3	Explaining the types of fingerprint patterns encountered at scene of crime.
	CO-4	Applying the procedure of physical and chemical techniques of developing fingerprints on crime scene evidence
	CO-5	Analyzing the significance of palm prints, and their historical importance in forensic science.
BFS-S-410	CO-1	Understanding the concept, principal and working mechanism of forensic auditing
	CO-2	Understanding the objectives and features of the Information Technology Act, 2000 and Application of the provisions enshrined in the Act by gathering data obtained from judicial precedents.

	CO-3	Describing the concept of Electronic world and issue related with cyber security
	CO-4	Examining the different kind of Fraud related with e-commerce and forensic accounting.
	CO-5	Analyzing the importance of a systematic procedure for investigation of data by applying data recovery methods and their significance in cyber security.
TMUGE401	CO-1	Remembering and understanding the English grammar and vocabulary.
	CO-2	Understanding the essentials of effective listening and speaking.
	CO-3	Understanding the corporate expectations and professional ethics.
	CO-4	Applying correct vocabulary and sentence construction during professional writing or job interviews.
	CO-5	Analyzing different types of interviews. Drafting resume, C.V. or cover letter.
BFS-S-408	CO-1	Understanding the fundamentals of solution in reference to the properties of ideal, non-ideal solutions.
	CO-2	Understanding the concepts of electrochemistry and conductance and their applications.
	CO-3	Explaining and analyzing the preparation and reaction of Di azonium salt and amines.
	CO-4	Analyzing the structure of carbohydrate, their chemical properties, reactivity.
	CO-5	Evaluating the various methods of potentiometric titrations.
BFS-S-409	CO-1	Understanding the concept of geometrical optics including the wave motion
	CO-2	Describing the superposition of a range of collinear and mutually perpendicular simple harmonic motions and their applications.
	CO-3	Explaining the different types of waves and their velocities: Plane, Spherical, Transverse, Longitudinal and the concept of concept of temporal and spatial coherence
	CO-4	Identifying the basic and advanced concept of holography, interference and diffraction
	CO-5	Applying the Fraunhofer Diffraction from apertures: Rectangular, Slit, Double Slit, Grating, Circular apertures.
TMUGS-401	CO-1	Communicating effectively in a variety of public and interpersonal settings.
	CO-2	Applying concepts of change management for growth and development by understanding inertia of change and mastering the Laws of Change.
	CO-3	Analyzing scenarios, synthesizing alternatives and thinking critically to negotiate, resolve conflicts and develop cordial interpersonal relationships.
	CO-4	Functioning in a team and enabling other people to act while encouraging growth and creating mutual respect and trust.
	CO-5	Handling difficult situations with grace, style, and professionalism.
BFS-S-510	CO-1	Understanding the concept of research, research types, goals and criteria of a good research, research process formulation, and research-related ethical issues.

	CO-2	Describing the concept of data collection, sampling & scaling techniques used in research design.
	CO-3	Applying the process of designing a research study from its inception to its report writing and its various components
	CO-4	Analyzing the data analysis-and hypothesis testing procedures in research.
	CO-5	Evaluating the interpretation of data in research methodology.
BFS-S-505	CO-1	Understanding the historical Development of the Forensic Ballistics and concept of Firearms, their Classification and working mechanism.
	CO-2	Explaining the definition, identification and examination of internal, external and terminal ballistics.
	CO-3	Describing the ammunitions, their identification, origin etc. with focus on improvised/ country made Imitative firearms and their constructional features.
	CO-4	Applying the importance of Gunshot Residue in reconstructing the case related to forensic ballistics.
	CO-5	Analyzing the bullets, cartridge cases, GRS (Gunshot residue) through various chemical and Instrumental Methods
BFS-S-503	CO-1	Remembering the fundamentals of DNA structure and examine the importance of the different steps involved in DNA typing.
	CO-2	Explaining the concept of serogenetic and genetic markers
	CO-3	Applying the various serological techniques used to evaluating the blood samples for criminal investigation. In examination of disputed identity cases employed in forensic science.
	CO-4	Applying the significance of markers in individualization of an individual and its admissibility as an evidence in court and report writing.
	CO-5	Analyzing the significance of DNA profiling in forensic science through case studies
BFS-S-506	CO-1	Understanding the concept, classification, handling and preservation of questioned document examination.
	CO-2	Identifying the concept of different types of frauds and forgeries by analyzing questioned documents
	CO-3	Applying the principles, general characteristics, individual characteristics, variability of handwriting, and analyzing this in comparing hand writing samples with unknown
	CO-4	Analyzing the concept of Forensic Linguistics and Stylistics in Questioned document.
	CO-5	Evaluating the analysis of charred documents and to determine whether the suspected currency note is genuine or forged.
BFS-S-508	CO-1	Remembering the fundamental principles of metallurgy and applications in various fields of metals and alloy behavior and their manufacturing processes
	CO-2	Understanding the Structure, bonding of s and p block materials and their oxides / compounds
	CO-3	Describing chemical kinetics: determination of order, molecularity, and theories of reaction rates determination of rate of opposing / parallel / chain reactions

	CO-4	Applying the Preparation, Properties And Reactions Of Hydrides Of Nitrogen, Halides And Oxohalides.
	CO-5	Analyzing the Concept of activation energy and its calculation from Arrhenius equation.
BFS-S-509	CO-1	Remembering the basic concepts of thermodynamics, the first and the second law of thermodynamics.
	CO-2	Explaining entropy and the associated theorems, the thermodynamic potentials and their physical interpretations.
	CO-3	Describing the kinetic theory of gases, Maxwell-Boltzman distribution law, equitation of energies, mean free path of molecular collisions, viscosity, thermal conductivity
	CO-4	Applying Fundamental concept of ideal and real gas in physics reactions
	CO-5	Analyzing the Behavior of Real Gases.
BFS-S-603	CO-1	Understanding the basic principles and theory of chromatographic and Electrophoresis techniques their usefulness in processing of crime scene evidence
	CO-2	Describing the concept of Spectroscopy, electromagnetic spectrum, sources of radiation their relevance in crime scene investigation
	CO-3	Applying the principles of Electrophoretic, chromatographic and spectroscopic techniques and their application in identifying chemical and biological materials.
	CO-4	Analyzing the laboratory procedures of chromatographic and Electrophoresis and spectroscopic
	CO-5	Evaluating the working of microscopy in visualizing trace evidence and comparing it with control samples.
BFS-S-606	CO-1	Understanding the concept of Forensic Toxicology, poisons and Drugs classification and nature of the toxicological investigations undertaken in forensic laboratories
	CO-2	Understanding the concept of Narcotic Drugs & Psychotropic Substances Act 1985.
	CO-3	Identifying the signs and symptoms of common poisoning (Corrosives, Irritants, Neurotropic, Asphyxiants, Cardiac, Spinal and Miscellaneous group).
	CO-4	Applying a complete knowledge to all laboratory procedures for the examination of biological and non biological evidence containing unknown drugs through systematic analysis
	CO-5	Analyzing the toxicological signs & symptoms of toxins and their pharmacological effect on the body when administered through case study.
BFS-S-604	CO-1	Understanding the concept of forensic psychology and its significance in crime scene investigation
	CO-2	Describing the objectives of mental health act and chapters and section related with mental health provisions of a mentally ill person.
	CO-3	Explaining the interface of psychology and the law, with a specific focus on sec 84 of insanity.
	CO-4	Applying the concept of psychological based investigative techniques like polygraph, Narcoanalysis and brain electrical oscillation signatures used in

		deception of truth.
	CO-5	Analyzing the concept of Nature of Insanity, insanity defense through various case studies
BFS-S-608	CO-1	Understanding the properties of transition metals like variable oxidation states, color, magnetic and catalytic properties
	CO-2	Describing the concept of vibrational motion in physical chemistry
	CO-3	Explaining the Schrodinger wave equation for Rigid rotor and Linear harmonic oscillator and calculate their respective energies.
	CO-4	Applying the fundamentals of photochemistry and laws governing it such as Beer Lambert law
	CO-5	Applying the quantum mechanical operators, quantization, probability distribution, uncertainty principle and application of quantization to spectroscopy.
BFS-S-609	CO-1	Understanding the concept of lattice, crystals and such as the reciprocal lattice and the Brillouin zone and the dynamics of atoms and electrons in solids and diffraction of X-rays by solids to determine the crystal structure.
	CO-2	Describing the concept of Type I and type II Superconductors.
	CO-3	Identifying the origin of the dielectric properties exhibited by solids and the concept of polarizability
	CO-4	Applying the basics of phase transitions and the preliminary concept and experiments related to Superconductivity in solid.
	CO-5	Applying the fundamentals of the elementary lattice dynamics and its influence on the properties of materials as well as concept of lattice vibrations, phonons.