

SoS in Forensic Science
M.Sc. Forensic Science
Program Structure
Semester- I

Semester	Course Nature	Course Code	Course Title	Course Type (T/P)	Hrs/ Week (L+T+P)	Credits	Marks		
							CIA	ESE	Total
Semester-I	Core	FST 110	Forensic Science & Criminology	T	5+1	5	30	70	100
	Core	FST 120	Crime Scene management	T	5+1	5	30	70	100
	Core	FST 130	Instrumental analysis in Forensic sciences	T	5+1	5	30	70	100
	Core	FST 140	Forensic Biology and Serology	T	5+1	5	30	70	100
	Core	FSL 150	Practicals Based on Crime Scene management	P	4	2	30	70	100
	Core	FSL 160	Practicals Based on Forensic Biology and Serology	P	4	2	30	70	100
Total				4/2	20+4+8	24	180	420	600

Skill Enhancement / Value Added Courses: Offered to the PG students of SoS in Forensic Science

Semester	Course Nature	Course Code	Course Title	Course Type (T/P)	Hrs/ Week (L+T+P)	Credits	Marks		
							CIA	ESE	Total
	VAC	FST 170	Indian knowledge system in Forensic Science	T	2	2	30	70	100

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SoS in Forensic Science

Program Structure

Semester- II

Semester	Course Nature	Course Code	Course Title	Course Type (T/P)	Hrs/ Week (L+T+P)	Credits	Marks		
							CIA	ESE	Total
Semester-II	Core	FST 210	Questioned Documents	T	4+1	4	30	70	100
	Core	FST 220	Forensic Genetics and DNA Profiling	T	4+1	4	30	70	100
	Core	FST 230	Forensic Chemistry and Toxicology	T	4+1	4	30	70	100
	Core	FST 240	Forensic Anthropology	T	4+1	4	30	70	100
	Elective-1 (Select any one)	FST 251	Nano Forensics	T	2+1	2	30	70	100
		FST 252	Forensic Psychiatry	T	2+1	2	30	70	100
		FST 253	Wildlife Forensics and Forensic Entomology	T	2+1	2	30	70	100
	Core	FSL 260	Practical's Based on Questioned Document	P	4	2	30	70	100
	Core	FSL 270	Practical's Based on Forensic Chemistry and Toxicology	P	4	2	30	70	100
	Core	FSL 280	Practical's Based on Forensic Anthropology	P	4	2	30	70	100
Core	FSL 290	Practical's Based on Wildlife Forensics and Forensic Entomology	P	4	2	30	70	100	
Total				5/4	18+5+16	26	270	630	900

Generic Elective Courses: Offered to the PG students of other SoS only

Semester	Course Nature	Course Code	Course Title	Course Type (T/P)	Hrs/ Week (L+T+P)	Credits	Marks		
							CIA	ESE	Total
	Generic Elective	FST 300	Elementary Forensic Science & Crime Scene Management	T	2	2	30	70	100

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SoS in Forensic Science

Program Structure

Semester- III

Semester	Course Nature	Course Code	Course Title	Course Type (T/P)	Hrs/ Week (L+T+P)	Credits	Marks		
							CIA	ESE	Total
Semester-III	Core	FST 310	Computer Forensics and Digital investigations	T	4+1	4	30	70	100
	Core	FST 320	Forensic Ballistics and Physics	T	4+1	4	30	70	100
	Core	FST 330	Forensic Medicine	T	4+1	4	30	70	100
	Core	FST 340	Research Methodology and Ethics	T	4+1	4	30	70	100
	Elective-1 (Select any one)	FST 351	Recent Advancement in Forensic Toxicology and Pharmacology	T	2+1	2	30	70	100
		FST 352	Forensic Genomics, Proteomics and Bioinformatics	T	2+1	2	30	70	100
		FST 353	Forensic Microbiology and Immunology	T	2+1	2	30	70	100
	Core	FSL 360	Practical's Based on Computer Forensics and Digital investigations	P	4	2	30	70	100
	Core	FSL 370	Practical's Based on Forensic Ballistics and Physics	P	4	2	30	70	100
	Core	FSL 380	Practical's Based on Forensic Medicine	P	4	2	30	70	100
	Core	FSL 390	Practical's Based on Forensic Genomics, Proteomics and Bioinformatics	P	4	2	30	70	100
Total				5/4	18+5+16	26	270	630	900

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Generic Elective Course: Offered to the PG students of other SoS only.

Semester	Course Nature	Course Code	Course Title	Course Type (T/P)	Hrs/Week (L+T+P)	Credits	Marks		
							CIA	ESE	Total
	Generic Elective	FST 400	Forensic Dermatoglyphics & Questioned Document	T	2	2	30	70	100

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SoS in Forensic Science

Program Structure

Semester- IV

	Course Nature	Course Code	Course Title	Course Type (T/P)	Hrs/ Week (L+T+P)	Credits	Marks		
							CIA	ESE	Total
Semester-IV	Elective -1 (Select any one)	FST 411	Recent Advancement in Forensic Photography	T	4+1	2	30	70	100
		FST 412	Recent Advancement in Forensic Biology	T	4+1	2	30	70	100
		FST 413	Recent Advancement in Forensic Serology & Immunology	T	4+1	2	30	70	100
	Elective -2 (Select any one)	FST 421	Recent Advancement in Forensic Physics	T	4+1	2	30	70	100
		FST 422	Recent Advancement in Forensic Ballistics	T	4+1	2	30	70	100
		FST 423	Recent Advancement in Questioned Documents and Fingerprints	T	4+1	2	30	70	100
	Core	FSL 430	Practicals Based on Recent Advancement in Forensic Biology	P	4	2	30	70	100
	Core	FSL 440	Practicals Based on Recent Advancement in Questioned Documents and Fingerprints	P	4	2	30	70	100
	Core	FSL 450	DISSERTATION+Viva	P	24	12+4	60	140	200
	Total				2/3	8+2+32	24	180	420

Skill Enhancement / Value Added Course: Offered to the PG students of SoS in Forensic Science

Semester	Course Nature	Course Code	Course Title	Course Type (T/P)	Hrs/ Week (L+T+P)	Credits	Marks		
							CIA	ESE	Total
	VAC	FST 170	Recent Advancement on Computer Forensics and Digital Investigation	T	2	2	30	70	100



2 Years, 4 Semesters PG Programme

In

Forensic Science

Semester I

(Faculty of Science)

2024-2025

School of Studies in Forensic Science

Pt. Ravishankar Shukla University, Raipur (C.G.)

Sheel *Gosh* *And* *Sanjiv*

SoS in Forensic Science
M.Sc. Forensic Science
Program Structure
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	VAC	FST 170	Indian knowledge system in Forensic Science	T	2	2	30	70	100

2 marks

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M.Sc. Forensic Science
Semester I
Paper 1: FST 110
FORENSIC SCIENCE AND CRIMINOLOGY

Maximum Marks: 70

Allotted credits: 05

UNIT I: Introduction to Forensic Science

Definition, Scope, History and Development, Nature need and Functions of Forensic science, Basic Principles of Forensic Science, Modus Operandi, Corpus Delicti, Organizational structure of Forensic Science Laboratories at State and Central level, FPB, NICFS, CDTS (Central Detective Training School), NCRB. Ethics in Forensic Science, Duties of Forensic Scientist, Laboratory management system and Importance of accreditation in forensic science laboratories.

UNIT II

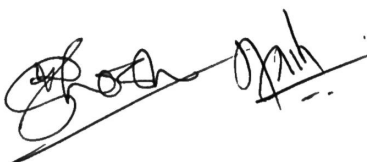
Law- General idea to IPC offences against person, offences against property, IEA (Sec 32, 45, 46, 47, 57, 58, 60, 65, 65B, 73, 135, 136, 137, 159), CrPC – Introduction, definitions, FIR, NCR, FIR and its evidentiary value, Complaint, bailable and Non-bailable offenses, powers of courts. Summons, warrant, relevant sections (CrPC Sec 154, 155, 174, 175, 291, 292, 293), and its relevant sections related to Forensic Science, Procedure for Investigation, Bail, Pre Trial Proceedings, Trial, Parole, Remand, Rights of accused and Victim.

UNIT III

Criminology: Definition & scope, crime & Criminal, Introduction to classification of Offences, theories of crime Causation Brief introduction to schools of Criminology; White Collor crime, Organized Crimes, Economic crimes, Cybercrimes, Crime against children and women.

UNIT IV

Police Science: Police Organizations at State and Central Level, Introduction to CBI, BPR&D. Interpole its Role and functions. Introduction to Punishment, theories, and types.



Recommended Book

1. Sharma, B.R.: Forensic Science in Criminal Investigation and Trials, Central Law Agency, Allahabad, 1974.
2. Lundquest & Curry: Forensic Science, Vol I to IV, 1963, Charls C. Thomas, Illinois, USA.
3. Saferstein : Forensic Science Handbook, Voll, II& III, Prentice Hall Inc. USA.
4. Saferstein: Criminalistics, 1976, Prentice Hall Inc. USA.
5. Kirk: Criminal Investigation, 1953, Interscience Publisher Inc. New York.
6. Lee & Gaensselen: Advances in Forensic Science (Vol.2) Instrumental Analysis.
7. Kleiner, Munay(2002):Handbook ofPolygraph testing. AcademicPress.
8. Hess, A.K.and Weiner,I.B.(1999)HandbookofForensicPsychology2ndEd.Johnwiley& sons.
9. BruceA. Arrigo (2000) Introduction to Forensic Psychology Academic Press, London
10. N. Gilbert; Criminal Investigation; Third edition, Macmillan Publishing Company, 1993

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M.Sc. Forensic Science

Semester I

Paper 2: FST 120

CRIME SCENE MANAGEMENT

Maximum Marks: 70

Allotted Credits: 05

Unit I

Introduction to Crime scene investigation Definition and Types of Crime scene, Principles of Forensic science, Experts team Composition, Role of First responding officer, Physical Evidences. Introduction, Definition, Types and their collection, Preservation, packaging, transporting, and forwarding, various techniques used for handling, Physical and trace evidences, Crime scene tool kits and equipments etc. Ethics in Crime Scene Investigation.

Unit II

Digital evidence: Introduction, Definition types and their collection, preservation, packaging, transporting, storage and forwarding, Methodological approach to processing the crime scene. Processing a crime scene, Searching the scene-Types of Searches, Zone Search: Ever Widening, Circle Strip Search, and Grid Search, Indoor searches and outdoor searches.

Unit III

Crime Scene Documentation, Crime Scene Photography, Videography, sketching and mapping. Chain of custody, interpreting a crime scene, Reconstruction of a crime scene.

Unit IV

Crime scene management of crime scene investigation in the cases of fire and Arson, Explosions, Burglary and Theft, Hit & run, Sexual offences, Death investigation. Use of Forensic light sources for detection of biological evidences at scene of crime scene, Presumptive test for identifying narcotic drugs, blood, semen, explosive and Gunshot residue sets. Computer graphics, Electronic Detectors ND Magnetic locators.



Recommended Books

1. Saferstein, Criminalistics: An Introduction to Forensic Science Prentice Hall INC, USA
2. James S.H. and Nordby, J.J. : Forensic Science- An introduction to scientific and Investigative Techniques, CRC Press USA.
3. Eckert W.G. Introduction to Forensic Sciences, CRC, New York
4. Siegel, J. A., Saukko, P. J. And Knupfer, G.C., Encyclopedia of Forensic Sciences, Academic Publishers, London
5. Kirk, P.L. Fire Investigations, John Wiley and Sons
6. Kirk, P.L.; Criminal Investigation, Interscience Publisher Inc New York.
7. Anita. Y. Wonder; Bloodstain Pattern Elsevier, London
8. Barry, A.J. Fisher.; Techniques of Crime Scene Investigation, 6th Edition Ed, C.R.C Press NY (2003)
9. Mordby, J. Deed Reckoning; The Art of Forensic Detection, CRC Pre LLC (2000)
10. Eckert, W.G & James S.H; Interpretation of Bloodstains, Evidence of Crime Scene, Elsevier Pub. NY (1989)

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M.Sc. Forensic Science

Semester I

Paper 3: FST 130

INSTRUMENTAL ANALYSIS IN FORENSIC SCIENCE

Maximum Marks: 70

Allotted credits: 05

UNIT I:

Concept of analytical forensic chemistry, qualitative and quantitative analysis. Basic concepts of Atomic spectra, Energy levels and Molecular spectra, Electromagnetic spectrum, Sources of radiation, Interaction of Energy and Matter, Introduction to spectroscopy, Basic Principle involve in various spectroscopic techniques, calibration methods, UV-Visible spectroscopy: Basic concepts, Principles and Forensic applications of UV-visible spectroscopy, Lambert-Beer law and its deviations, fluorescence spectroscopy, Luminometry, InfraRed (IR) and Raman spectroscopy, Fourier transform InfraRed (FTIR) spectrophotometer, Surface Plasma Resonance (SPR), Nuclear Magnetic Resonance spectroscopy

UNIT II:

Chromatography: General introduction to chromatography, Basic concepts, principles, performance parameter and functions. Adsorption chromatography, Partition chromatography Thin Layer chromatography (TLC), Affinity Chromatography, Gel Exclusion Chromatography, Ion Exchange chromatography, High Performance Liquid Chromatography (HPLC), Gas Chromatography (GC) and High-performance Thin layer Chromatography (HPTLC). Detector and its types.

UNIT III:

Spectrophotometry: General introduction, Basic concepts, Principles and Forensic application of Atomic Absorption Spectrophotometry (AAS), Atomic emission Spectrometry (AES), Inductive coupled plasma (ICP), X-ray diffraction (XRD), X-ray Photoelectron spectroscopy (XPS), Auger remission spectroscopy, Mass spectrometry. Differential Scanning Calorimeter (DSC), Differential Thermal Analyzer (DTA), Neutron Activation Analysis (NAA),

Unit IV:

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DNA Sequencing methods, capillary Electrophoresis, Genetic Analyzer, Polymerase Chain Reaction, real time PCR, Microarray, Karyotyping and FISH, Basic principles of Microscopy. Comparison microscope, Stereoscopic microscope, Fluorescent Microscopy, Infrared Microscope, Scanning Electron Microscope (SEM)&Transmission Electron Microscope (TEM)

Recommended Books

1. Sharma, B.R. Scientific Criminal investigation, Universal Law Publishing Co.
2. Eckert W.G. Introduction to Forensic Sciences, CRC, New York
3. Siegel, J.A., Saukko, P. J. And Knupfer, G.C., Encyclopedia of Forensic Sciences, Academic Publishers, London.
4. John C. Lindon, George E. Tranter & John L. Holmes; Encyclopedia of Spectroscopy & Spectrometry, Academic Press (2000)
5. Cottrell, C.T. Irish, D., Msters VM., and Steward, J.E. (1985) Introduction to ultraviolet and visible spectrophotometry, 2nd ed. Pye Unicam, Cambridge A Practical Guide to Modern NMR for Chemists, OUP, Oxford, 2000
6. Gunther, H., NMR Spectroscopy. Basic Principles, Concepts and Applications in Chemistry, 2nd Edn, Wiley, Chichester, 1995 Davis, R. and Frearson, M. (1987) Mass Spectrometry, Wiley, London Alan Gunn Essential forensic biology Jhon. Wiley
7. Barbara Wheeler Lori J. Wilson, Practical Forensic Microscopy: A Laboratory Manual.
8. Bryan L. William & Keith Wilson; Principles & Techniques of Practical Biochemistry, Edward Arnold Pub. (1975)
9. Keith Wilson & John Walker; Practical Biochemistry- Principles & Techniques, 5th Ed., Cambridge University Press
10. George M. Malacinski; Essentials of Molecular Biology, 4th Ed. Jones and Bartlet Pub. (2003).
11. Gardnes & Snustd; Principles of Genetics 6th Ed., John Wiley & Sons
12. Working Procedure Manual Biology/ Serology, DFS Pub New Delhi, 2005

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M.Sc. Forensic Science
Semester I
Paper 4: FST 140
FORENSIC BIOLOGY AND SEROLOGY

Maximum Marks: 70

Allotted credits: 05

Unit-1

Introduction to Forensic Biology. Biological fluids of forensic significance (Blood, Semen, Saliva, Sweat, Urine, Vitreous humour, Amniotic fluid, Milk, Faecal matter). Cellular component of Blood. Hair and its forensic importance. Blood grouping systems (ABO, Rh, MN, Duffy, Kidd, Kell, Lutheran and P system). Biology of pollen and its forensic significance. Microbes of forensic importance.

Unit-II

Forensic Biochemistry. pH, Buffer. General Introduction of Biomolecules (Structure & Function). Antigen, Antibody & Lectins. Introduction to Enzyme & Hormones. Identification (Presumptive and confirmatory) of evidences of biological origin. Biochemical markers of Forensic significance.

Unit-III

Serological Techniques. Collection and preservation of biological evidence. Antigen-antibody interaction (Agglutination, Precipitation) and serological techniques based up on it (ELISA, RIA, Complement fixation, Immuno-diffusion). Electrophoresis (SDS-PAGE, Agarose Gel, Immuno-electrophoresis, Isoelectric Focussing). Species identification & Blood typing (Wet & Dry). Blood pattern analysis (Blood stain characteristics, types, documentation) & its application in forensic investigation.

Unit-IV

Wild Life Forensic & Entomology. Wildlife Forensic: Recovering evidence at poaching scenes; Illegal wildlife trade, Species identification, Protected and endangered species of animals and plants; Sanctuaries and their importance; Relevant provision of wild life and environmental act; Types of wildlife crimes, Wildlife artefacts (Bones, skin, fur, hair, nails, blood, feather, etc.). Insects of forensic importance; collection of entomological evidence during legal investigations, entomological samples (from the body, during autopsy, from buried remains from enclosed structures & aquatic habitats). Factors that influence insect succession on carrion, molecular methods for Forensic Entomology.

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Recommended Books

1. Robertson, J. (1996): Forensic Examination of Hair. Taylor and Francis, USA.
2. Modi, J.K.: Medical Jurisprudence and Toxicology, N. M. Tripathi Pvt. Ltd.
3. Fraser, Roberts J. A. (1965): An introduction to Medical Genetics.
4. Chatterjee, C. C. (1975): Human Physiology.
5. Boorman, K. E: Blood Group Serology, Churchill, and Lincoln, P. J. (1988)
6. Race, R. R. and Sangar, R. Blood Groups in Man. Blackwell Scientific, Oxford.
7. Saferstein, R. (1982): Science Handbook, Vol. I, II and III, Prentice Hall,
8. Barris, H. and Hopkinson, D. A. (1976): Handbook of Enzyme, Electrophoresis, Elsevier, North, Holland, New York.
9. Gilblet, E. (1969): Marker's in Human Blood, Davis, Pennsylvania.
10. Culliford, B. E. (1971), the examination and Typing of Blood Stains, US Dept. of Justice, Washington.
11. Chowdhuri, S. (1971): Forensic Biology, BPR&D, Govt. of India.
12. Dunsford, I. and Bowley, C. (1967): Blood Grouping Techniques, Oliver & Boyd, London.
13. Eckert, W. G. & James, S. H. (1989): Interpretation of Blood Stain, Evidence, Elsevier, New York.
14. Coyle, H. M, Forensic Botany, CRC Press Working procedure manual: Biology/Serology; DFS, New Delhi.
15. Mary Alice Walker, Entomology and Palynology (Solving Crimes with Science: Forensics) Mason Crest Publisher.
16. Essential Forensic Biology, Alan Gunn, Wiley

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M.Sc. Forensic Science
Semester I
Paper 5: FSL 150
PRACTICALS BASED ON CRIME SCENEMANAGEMENT

Maximum Marks: 70

Allotted credits: 02

1. Evaluation of Crime scene and photographs
2. Searching of physical evidence at crime scene.
3. Collection of evidence with individual characteristics:
(1) Fingerprints (2) Tire tracks and foot impressions
4. Analysis of pattern Blood stain pattern, Fire pattern
5. Lifting of prints and impressions by caste and replicas.
6. Sole prints comparison and their lifting from the scene of crime.
7. Collection, packing and preservation of biological evidences
8. Reconstruction of crime scene
9. Preparation of report of the examination.



M.Sc. Forensic Science

Semester –I

Paper 6: FSL 160

PRACTICALS BASED ON FORENSIC BIOLOGY AND SEROLOGY

Maximum Marks: 70

Allotted credits: 02

1. PBMC isolation and cell counting by hemocytometer.
2. ABO blood grouping.
3. Presumptive and confirmatory test of semen.
4. Presumptive and confirmatory test of blood.
5. Starch iodine test of saliva.
6. Immunodiffusion techniques.
7. Forensic report writing.
8. Identification of developmental stage of housefly.
9. Age estimation of plant by analysis of Annual Ring.

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M.Sc. Forensic Science
Semester I
Paper 7: FST 170
Indian Knowledge System in Forensic Science

Maximum Marks: 70

Allotted credits: 02

Unit I: Criminal Investigation in Ancient India

Ancient Indian legal texts i.e., Manusmriti, Arthashastra, and Yajnavalkya Smriti guidelines for investigating crimes, identifying culprits, and delivering justice. Arthashastra & Kautilya espionage and surveillance techniques.

Unit II: Application of Ayurveda in Forensic Science

Toxicology (Vishachikitsa): various poisons (plant, animal, and mineral origins) and their symptoms, treatments, and effects. Postmortem Analysis: in Sushruta Samhita.

Unit III: Cultural Practices and Criminal Psychology

Forensic psychology. Traditional methods of understanding human behaviour, motives, and intentions.

Unit IV: Environmental Forensic at Ancient India:

Ancient Indian knowledge of soil, water, and environmental elements often played a role in understanding crimes (e.g., poisoning of water sources) Trace contaminants and toxins.

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