SHRI VAISHNAV VIDHYAPEETH VISHVAVIDHYALAYA, INDORE

B.Sc. / B.Sc.-M.Sc. (Forensic Science) CBCS

Semester-VI (B.Sc. / B.Sc.-M.Sc.)
Name of Program B.Sc. / B.Sc.-M.Sc. (Forensic Science)

Course Code	Course Name	TEACHING & EVALUATION SCHEME								
		THEORY			PRACTICAL		L	T	P	Credits
		End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSFS601	Forensic Anthropology	60	20	20	30	20	3	1	2	5

Legends: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment shall be based following Components: Quiz / Assignment / Project / Participation in Class, given that no component shall exceed more than 10 marks.**

Learning Objectives: After studying this paper the students will know –

1. Importance of forensic anthropology in identification of persons.
2. Significance of somatoscopy and somatometry. .
3. Different techniques of facial reconstruction and their forensic importance.
4. Importance of Facial Reconstruction in Investigation .

Unit 1: Introduction to Forensic Anthropology
Definition, scope and Problems related to Forensic Anthropology. Human skeleton, comparative skeletal anatomy of human and non-human.

Identification of bones and determination of sex: Age determination from skeletal remains: General considerations, classification of bones, suture closure in skull and ossification in other bones. Sex determination from skeletal remains: skull, Pelvis, and other bones. Estimation of stature from skeletal remains with special reference to long bones.

Unit 2: Somatoscopy
Observation of hair on head, forehead, eyes, root of nose, nasal bridge, nasal tip, chin, Darwin's tubercle, ear lobes, supra-orbital ridges, physiognomic ear breadth, circumference of head. Scar marks and occupational marks.

Unit 3: Somatometry
Measurements of head, face, nose, cheek, ear, hand and foot, body weight, height. Indices - cephalic index, nasal index, cranial index, upper facial index.

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
INDORE (M.P.)

Unit 4: Facial Reconstruction-I

Portrait Parle/ Bertillon system. Photofit/identi kit. **Facial superimposition techniques**: Cranio facial super imposition techniques, photographic super imposition, videosuperimposition, Roentgenographic superimposition.

Unit 5: Facial Reconstruction-II

Use of somatoscopic and craniometric methods in reconstruction. Importance of tissue depth in facial reconstruction. **Genetic and congenital anomalies** – causes, types, identification and their forensic significance.

List of Practical:

1. To determine age from skull and teeth.
2. To determine sex from skull.
3. To determine sex from pelvis.
4. To study identification and description of bones and their measurements.
5. To investigate the differences between animal and human bones.
6. To perform somatometric measurements on living subjects.
7. To carry out craniometric measurements of human skull.
8. To estimate stature from long bone length.
9. To conduct portrait parley using photo fit identification kit

Suggested Readings:

1. M.Y. Iscan and S.R. Loth, The scope of forensic anthropology in, Introduction to Forensic Sciences, 2nd Ed., W.G. Eckert (Ed.), CRC Press, Boca Raton (1997).
2. D. Ubelaker and H. Scammell, Bones, M. Evans & Co., New York (2000).
3. S.Rhine, Bone Voyage: A Journey in Forensic Anthropology, University of Mexico Press, Mexico (1998).

COORDINATOR
Shri Vaishnavi Institute of Forensic Science

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
INDORE (M.P.)

SHRI VAISHNAV VIDHYAPEETH VISHVAVIDHYALAYA, INDORE

B.Sc. / B.Sc.-M.Sc. (Forensic Science) CBCS

Semester-VI (B.Sc. / B.Sc.-M.Sc.)
Name of Program B.Sc. / B.Sc.-M.Sc. (Forensic Science)

Course Code	Course Name	TEACHING & EVALUATION SCHEME								
		THEORY			PRACTICAL		L	T	P	Credits
		End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSFS602	Medical Jurisprudence	60	20	20	30	20	3	1	2	5

Legends: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment shall be based following Components: Quiz / Assignment / Project / Participation in Class, given that no component shall exceed more than 10 marks.**

Learning Objectives: After studying this paper the students will know –

1. Fundamental aspects of forensic medicine
2. Somatic, Cellular and Molecular Death.
3. Forensic Taphonomy

Unit 1: Introduction to Forensic Medicine
Fundamental aspects and scope of forensic medicine. , Approaching the crime scene of death. Obtaining first-hand information from the caller. Rendering medical assistance to the victim, if alive. Protecting life. Inquest: Inquest by police, magistrate Medical certification and medico-legal reports including dying declaration.

Unit 2: Death
Definition, Types: Somatic, Cellular and Brain-Death. Mode of death: Asphyxia, Syncope, Coma Sudden natural and unnatural deaths. Suspended animation.

Unit 3: Forensic Taphonomy (Postmortem Changes)
Immediate Changes: Insensibility and loss of voluntary power, Cessation of respiration.
Early Changes: cooling of body, lividity, rigor mortis, cadaveric spasm, cold stiffening and heat stiffening. **Late Changes (Decomposition and decay):** Putrefaction, mummification, adipocere and maceration, Postmortem artifacts.

Unit 4: Medico-legal autopsies
Definitions of medico-legal and clinical/pathological autopsies. Objectives, procedures, formalities of medico-legal autopsies. Preservation of articles of importance, during autopsy. Preservation of body fluids & viscera in suspected poisoning.

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
INDORE (M.P.)

Unit 5: Mechanical injuries or wounds

Definition, classification of mechanical injuries; description of blunt force, sharp force and firearm injuries.Medico-legal aspects of injuries, differences between antemortem and post-mortem injuries; estimation of age of different types of injuries, defense injuries, hesitation cuts; fabricated injuries; simple and grievous hurt, suicidal/accidental/homicidal injuries; causes of death by mechanical injuries. Identification of injuries by torture.

List of Practicals:

1. To design a questionnaire for the first responder to the death scene.
2. To design a checklist for the forensic scientists at the death scene.
3. To design a canvass form giving description of an unidentified victim.
4. Practical aspects of collection, preservation and dispatch of viscera for chemical analysis
5. To give the demonstration of postmortem and ante-mortem wound.
6. Examination of certification of injuries.

Suggested Readings:

1. K. Smyth, The Cause of Death, Van Nostrand and Company, New York (1982).
2. M. Bernstein, Forensic odontology in, Introduction to Forensic Sciences, 2nd Ed., W.G. Eckert (Ed.), CRC Press, Boca Raton (1997).
3. J. Dix, Handbook for Death Scene Investigations, CRC Press, Boca Raton (1999).
4. II.B. Baldwin and C.P. May in, Encyclopedia in Forensic Science, Volume 1, J.A. Siegel, P.J. Saukko and G.C. Knupfer (Eds.), Academic Press, London (2000).
5. V.J. Geberth, Practical Homicide Investigation, CRC Press, Boca Raton (2006).
6. T. Bevel and R.M. Gardner, Bloodstain Pattern Analysis, 3rd Edition, CRC Press, Boca Raton (2008).
7. W.J. Tilstone, M.L. Hastrup and C. Hald, Fisher's, Techniques of Crime Scene Investigation, CRC Press, Boca Raton (2013).
8. Forensic Taphonomy, edited by Wouldiam D. Haglernd, Marculla H. Sorg; CRC Press, LLC, 1997. 14. Glaister (Ed)-Rentoul & Smith (1973) ;
9. Forensic Medicine & Toxicology, Churchill Livingston, Edinburgh.
10. Modi, J.K. (1988): Medical Jurisprudence & Toxicology

COORDINATOR
Shri Vaishnavi Institute of Forensic Science

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
INDORE (M.P.)

SHRI VAISHNAV VIDHYAPEETH VISHVAVIDHYALAYA, INDORE

B.Sc. / B.Sc.-M.Sc. (Forensic Science) CBCS

Semester-VI (B.Sc. / B.Sc.-M.Sc.)
Name of Program B.Sc. / B.Sc.-M.Sc. (Forensic Science)

Course Code	Course Name	TEACHING & EVALUATION SCHEME								
		THEORY			PRACTICAL		L	T	P	Credits
		End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSFS603	Introductory Forensic Physics	60	20	20	30	20	3	1	2	5

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
***Teacher Assessment shall be based following Components: Quiz / Assignment / Project / Participation in Class, given that no component shall exceed more than 10 marks.**

Learning Objectives: After studying this paper the students will know –'

1. The type of glass and their forensic importance
2. The composition and forensic analysis of soil
3. The utility of paint in criminal investigation.'
4. The elemental analysis of Paint and cement

Unit 1: Glass
Types of glass and their composition, Forensic examination of glass fractures under different conditions, determination of direction of impact, 3R-rules: cone- fracture, rib marks, hackle marks, backward fragmentation, colour and fluorescence, density comparison, physical matching and measurements, refractive index by refractometer, refractive index by Becke line technique, elemental analysis, interpretation of glass evidence, Standard Operating Procedures for examination, Discussion on important case studies of glass evidence.

Unit: 2 Soil
Formation and types of soil, composition and colour of soil, particle size distribution and turbidity test, microscopic examination, density gradient analysis, ignition loss, differential thermal analysis, elemental analysis, interpretation of soil evidence, Standard Operating Procedures for examination, Discussion on important case studies of soil evidence.

Unit: 3: Paint
Types of paint and their composition, macroscopic & microscopic studies, pigment distribution and colorimetry, micro-chemical analysis- solubility test, TLC, pyrolysis chromatographic techniques, IR absorption spectroscopy of paint samples & X-ray diffraction, elemental analysis,

Registrar
Vidyapeeth Vishwavidyalaya

interpretation of paint evidence, Standard Operating Procedures for examination, Discussion on important case studies of paint evidence.

Unit:4: Fibre

Classification of textile fibres - production, structure, and properties, the structure of textiles - an introduction to the basics, ropes and cordage, examination of damage to textiles, recovery & collection of fibre evidence & Standard Operating Procedures for examination protocols, visible & infrared microscopical examination of fibres, instrumental methods used in fibre and dye examination, interpretation of fibre evidence, new fibres types, discussion on important case studies of fibre evidence.

Unit:5: Cement

Types of cement and their composition, sampling of cement evidence material, determination of adulterants in cement, bromoform test, fineness test, loss on ignition test of cement; Physical and instrumental methods of cement analysis: determination of compressive strength, setting times, initial and final setting time, standard consistency, chemical methods of cement analysis, x-ray powder diffraction- identification of adulterated cement and adulterants. Cement mortar and Cement concrete: Sampling and methods of analysis.

Practicals:

1. To compare soil samples by density gradient method.
2. To compare paint samples by physical matching method.
3. To compare paint samples by thin layer chromatography method.
4. 6. To compare glass samples by refractive index method.
5. To identify and compare tool marks.
6. To compare cloth samples by physical matching.

Suggested Readings:

1. M. Byrd, Crime Scene Evidence: A Guide to the Recovery and Collection of Physical Evidence, CRC Press, Boca Raton (2001).
2. T.J. Gardener and T.M. Anderson, Criminal Evidence, 4th Ed., Wadsworth, Belmont (2001).
3. S.H. James and J.J. Nordby, Forensic Science: An Introduction to Scientific and Investigative Techniques, 2nd Edition, CRC Press, Boca Raton (2005).
4. W.J. Tilstone, M.L. Hastrup and C. Hald, Fisher's, Techniques of Crime Scene Investigation, CRC Press, Boca Raton (2013).

Registrar
Vidyapeeth Vishwavidyalaya
INDORE (M.P.)

SHRI VAISHNAV VIDHYAPEETH VISHVAVIDHYALAYA, INDORE

B.Sc. / B.Sc.-M.Sc. (Forensic Science) CBCS

Semester-VI (B.Sc. / B.Sc.-M.Sc.)
Name of Program B.Sc. / B.Sc.-M.Sc. (Forensic Science)

Course Code	Course Name	TEACHING & EVALUATION SCHEME								
		THEORY			PRACTICAL		L	T	P	Credits
		End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSFS 6041	**DNA Typing**	60	20	20	30	20	3	1	2	5

Legends: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment shall be based following Components: Quiz / Assignment / Project / Participation in Class, given that no component shall exceed more than 10 marks.**

Learning Objectives: After studying this paper the students will know –

1. The basic principle of DNA analysis.
2. The importance of short tandem repeats and restriction fragment length polymorphism in DNA technique.
3. The forensic significance of DNA typing, i.e parentage testing etc.
4. The report writing procedure
5. The legal perspective of DNA typing.

Unit 1: Basics of DNA Typing
History of DNA fingerprinting. Basic Principles, DNA as biological blueprint of life. Extraction of DNA for analysis. Quantization of DNA – yield gel quantitation and slot blot quantitation.

Unit 2: Forensic DNA Typing Collection of specimens:
Polymerase chain reaction: Historical perspective, sequence polymorphisms, individualization of evidence. Short tandem repeats (STR): Role of fluorescent dyes, nature of STR loci. Restriction fragment length polymorphism (RFLP): Genetic markers used in RFLP, typing procedure and interpretation of results. Mitochondrial DNA – Sequence analysis. Touch DNA

Unit 3: Forensic Significance of DNA Profiling
Parentage Testing Principles of heredity. Genetics of paternity. DNA testing in disputed paternity. Mandelian laws of parentage testing. Mathematical basis of parentage identification. Missing body cases. Veterinary & wild life and Agriculture cases

Registrar

Unit 4: Report Writing

Role of DNA typing in identifying unrecognizable bodies. Evaluation of result. Frequency calculations, Interpretation, Allele frequency determination, Hardy-Weinberg law. Match probability: Reference populations and databases, Quality control, Certification and Accreditation.

Unit 5: Legal perspective

Legal standard for admissibility of DNA profiling – procedural & ethical concerns, status of development of DNA profiling in India & abroad.

Recent technologies: DNA chips, SNPS, DNA cloning, Limitations of DNA profiling.

List of Practicals:

1. To carry out the separation of amino acids by thin layer chromatography.
2. To carry out extraction of DNA from body fluids.
3. To preparation of gel plates for electrophoresis.
4. To carry out electrophoresis for separation of enzymes.
5. To prepare a report on the role of DNA typing in solving paternity disputes.

Suggested Readings :

1. J.M. Butler, Forensic DNA Typing, Elsevier, Burlington (2005).
2. K. Inman and N. Rudin, An Introduction to Forensic DNA Analysis, CRC Press, Boca Raton (1997).
3. H. Coleman and F. Swenson, DNA in the Courtroom: A Trial Watcher's Guide, GeneLex Corporation, Washington (1994).
4. W.J. Tilstone, M.L. Hastrup and C. Hald, Fisher's, Techniques of Crime Scene Investigation, CRC Press, Boca Raton (2013).
5. Daniel L. Hartl & Elizabeth W. Jones; Genetics- Principle & Analysis, 4th Ed., Jones & Bartlet Pub. 1998.
6. Jaiprakash G. Shewale, Ray H. Liu Forensic DNA Analysis: Current Practices and Emerging Technologies, CRC Press, 2013
7. John M Butler: Forensic DNA Typing. Elsevier Academic Press.
8. Lee M.C. and Gaenesten, R.E: DNA and other Polymorphism in Forensic Science. Year book Medical Published.

Chairperson
Board of Studies
Shri Vaishnavi Institute of Forensic Science

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
DCPE (M.P.)

SHRI VAISHNAV VIDHYAPEETH VISHVAVIDHYALAYA, INDORE

B.Sc. / B.Sc.-M.Sc. (Forensic Science) CBCS

Semester-VI (B.Sc. / B.Sc.-M.Sc.)
Name of Program B.Sc. / B.Sc.-M.Sc. (Forensic Science)

Course Code	Course Name	TEACHING & EVALUATION SCHEME								
		THEORY			PRACTICAL		L	T	P	Credits
		End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSFS6042	Wild Life Forensics	60	20	20	30	20	3	1	2	5

Legends: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment shall be based following Components: Quiz / Assignment / Project / Participation in Class, given that no component shall exceed more than 10 marks.**

Learning Objectives: After studying this paper the students will know –

1. The difference between protected and endangered species.
2. Types of wild crimes
3. Crimes related to reptiles
4. Trade in wild animals
5. Different Wildlife artifacts

Unit 1:
Wildlife Forensic: Definition and Scope, Protected and endangered species of animals and plants; Sanctuaries and their importance; Relevant provision of wild life and environmental act;

Unit 2:
Types of wildlife crimes, Poaching and hunting, different methods of killing and poaching of wildlife animals; Enforcement of wildlife protection policy,

Unit 3
International trade in reptile skins, Challenges to species identification of reptile skin products, species and products represented in the reptile skin trade, reptile scale morphology basics and current limitations, Identifying features of major reptile groups. Wildlife (Protection) Act-1972

Unit 4
Trade in wild animals, elephant-, Indian rhino, wild cat, poisonous snakes for venom and skin, crocodiles, salamanders, deer, birds (feathers Macau parakeets, whales, sharks, spectacle bear, Himalayan antelopes.

CONTROLLER — Registrar — Vidyapeeth Vishwavidyalaya, INDORE (M.P.)

UNIT 5

Wild animals as pharmacopeias, Wildlife artifacts (Bones, skin, fur , hair, nails, blood, feather, etc.), Recovering evidence at poaching scenes, Locating the burial site: Anomalies on the surface

Practicals:

1. Identification of species from pug marks
2. Sex determination from Pug- marks.
3. Casting of pug marks
4. Collection and seizure of wildlife evidences
5. Examination of Species from feathers and fur
6. Case study of wildlife crimes

Suggested Readings:

1. Forensic science in wild life investigation, Linarce, Adrian CRC Press, Taylor & Francis
2. The wild life (protection) act, Baalu, T.R.1972, Nataraj Publication
3. Wild life (Protection act, 1972), Universal Publication

COORDINATOR
Vaishnavi Institute of Forensic Science
Registrar
Vaishnav Vidyapeeth Vishwavidyalaya
INDORE (M.P.)

Semester-VI (B.Sc. / B.Sc.-M.Sc.)
Name of Program B.Sc. / B.Sc.-M.Sc. (Forensic Science)

Project Work

Course Code	Course Name	TEACHING & EVALUATION SCHEME								
		THEORY			PRACTICAL		L	T	P	Credits
		End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSFS 605	**Project Work**	0	0	0	60	40	0	0	8	4

Every student will carry out "**Project Work"** the supervision of Supervisor/(s) (Internal/External). The topic shall be approved by a Committee constituted by the Head of the concerned Institute. Every student will be required to present two seminar talks, first at the beginning of the project work (Phase-I) to present the scope of the work and to finalize the topic, and second towards the end of the semester, presenting the work carried out by him/her in the semester.

COORDINATOR
Vaishnavi Institute of Forensic Science

Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
INDORE (M.P.)