

**Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore**  
**Shri Vaishnav Institute of Forensic Science**

**M.Sc. (Forensic Science)**  
**SEMESTER III 2022-2024**

**MSFSN301 QUESTIONED DOCUMENTS AND COUNTERFEIT CURRENCY**

COURSE CODE	CATEGORY	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*				
MSFSN301	DC	Questioned Documents and Counterfeit Currency	60	20	20	30	20	4	0	2	5

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit;

\*Teacher Assessment shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

**COURSE OBJECTIVES:**

The course aims to provide the students with

1. The forensic document examination
2. The forensic identification of class and individual characteristics of handwriting.
3. Examination of fake credit cards, e-documents, digital signature.
4. Automated finger print identification system.
5. Analysis of signature forgery.

**COURSE OUTCOMES:**

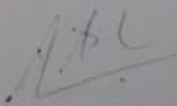
After studying this course students will

1. Know about the handling and forensic examination of Document.
2. Be able to examine forgery in documents
3. Be able to examine signature forgery

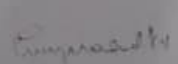
**COURSE CONTENT**

**UNIT 1: Introduction to Document Examination**

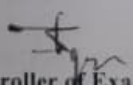
Nature and problems of document examination, classification of forensic documents, Specimen/Admitted writings/type writings etc: handling, preservation and marking of documents, importance of natural variations and disguise in writing, various types of forensic documents-genuine and forged documents, holographic documents, principles of handwriting identification, basic tools needed for Forensic Document Examination & their use, analysis of paper and inks.


  
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**UNIT 2: Handwriting examination**

Various writing features and their estimation, general characteristics of handwriting, individual characteristics of handwriting, ethnic and gender variability of handwriting, various types of forgeries and their detection.

**UNIT 3: Signature examination**

Examination of signatures – characteristics of genuine and forged signatures, identification of forger, identification of writer of anonymous letters and application of Forensic Stylistics/Linguistics in the identification of writer, examination of built-up documents and determination of sequence of strokes.

**UNIT 4: Typewritten and Printed Documents**

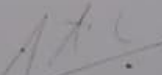
Identification of typescripts-identification of typist, various types of printing processes, identification of printed matter including printing of security documents and currency notes, identification of electronic typewriters, dot matrix, inkjet and laser jet printers, examination of black and white and color photocopies, fax messages and carbon copies.

**UNIT 5: Forgery Detection**

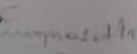
Determination of age of documents by examination of signatures, paper, ink etc., Examination of alterations, erasures, over writings, additions and obliterations, decipherment of secret writings, indentations & charred documents, physical matching of documents, examination of seal, rubber and other mechanical impressions, examination of counterfeit currency notes, Indian passport/visas, stamp papers, postal stamps etc., examination of fake credit cards, e- documents, digital signatures, an introduction of computer forensics, preliminary examination of documents, opinion writings and reasons for opinion.

**SUGGESTED READINGS:**

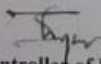
1. Hilton, O; Scientific Examination of Questioned Documents. Revised Edition, Elsevier, New York, 1982.
2. Osborn, A.S; Questioned Documents, 2nd Ed., universal Law Publications, Delhi, 1998.
3. Osborn, A.S; The Problem of Proof, 2nd Ed., Universal Law Pub. Delhi, 1998.
4. Thomas, C.C; Identification System for Questioned Documents, Billy Prior BatesSpringfield, Illinois, USA, 1971.
5. Harrison, W.R; Suspect Documents Their Scientific Examination, Universal Law Publication, Delhi, 2001.
6. Morris, R.N; Forensic Handwriting Identification, Academy Press, London, 2001.

  
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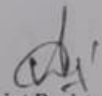
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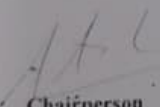


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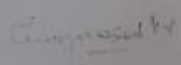
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**PRACTICALS:**

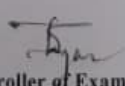
1. Forensic identification of class and individual characteristics of handwriting.
2. Analysis of signature forgery.
3. Examination of anonymous letters and disguised writing.
4. To detect and decipher alterations in a document.
5. To decipher secret writings, indentations and charred documents.
6. To study the handwriting of ethnic and population groups.
7. To examine forgery in currency notes.
8. To examine security features of Indian passports.
9. To examine credit cards under Visual Spectral Comparator.
10. Rubber seal examination
11. Document opinion Report writing.
12. Any other related to the course


  
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**MSFSN302 FORENSIC BIOLOGY AND DNA PROFILING**

COURSE CODE	CATEGORY	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*				
MSFSN302	DC	Forensic Biology and DNA Profiling	60	20	20	30	20	4	0	2	5

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

\*Teacher Assessment shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

**COURSE OBJECTIVES:**

The course aims to provide the students with

1. The significance of blood, semen, saliva hairs etc
2. The importance of bones in personal identification
3. The identification of different blood groups and other biochemical markers of individuality
4. Role of insects, microbial and diatoms in forensic investigation
5. DNA structure analysis and DNA typing

**COURSE OUTCOMES:**

After studying this course student will

1. Have the understanding of various forms of biological evidence.
2. Be able to determine the importance of biological evidence such as blood semen saliva etc in crime investigation.
3. Be able to identify different blood groups and other biochemical markers of individuality
4. Be able to evaluate the significance of Microbes, insects and diatoms criminal Investigations.
5. Be able to understand the structure of DNA and DNA typing.

**COURSE CONTENT**

**UNIT I:**

**Blood**

Composition, histology, examination of blood and blood stains, Identification of lochial and menstrual stains by various methods.

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**Semen:** Composition, Structure of spermatozoa, Forensic method of detection and identification of semen and seminal stain examination. Identification and examination of other body fluids/ stains- vaginal, saliva, urine, pus, faeces, vomit, milk, sweat and tears.

**Hair:** Structure, Forensic examination of Hair including determination of origin race, sex, etc.

**UNIT II:**

**Biochemical techniques**

Biological and biochemical techniques: General principles of Biological/ Bio-chemical Analysis, pH and buffers, Physiological solution, cell and tissue culture, Cell fractionation, Biological variations etc. Centrifugation Techniques, Immuno-chemical Technique, General principles, Production of antibodies, Precipitin reaction, Gel immune-diffusion, Immuno-electrophoresis, complement fixation, RadioImmuno Assay (RIA), Enzyme-linked Immuno Sorbent Assay(ELISA), Fluorescence immuneassay. Chromatographic Techniques, Electrophoretic Technique: General principles, Factors affecting electrophoresis, Low voltage thin sheet electrophoresis, High voltage electrophoresis, Sodium dodecyl sulphate(SDS) polyacryl amide gel electrophoresis, Isoelectricfocusing(IEF), Isoelectrophoresis, Preparative electrophoresis, Horizontal and Vertical Electrophoresis.

**UNIT III:**

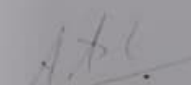
**Forensic Serology**

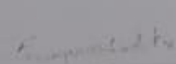
**Basic Concept of Genetics :** Mendelian genetics, genotypes, phenotypes, mutation, multiple alleles, Expression of Gene and Gene Mapping. Analysis of protein by electrophoretic methods

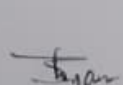
**Immunology:** Immuno System, Immuno response, Antigens, haptens and adjuvant, Immunoglobulin's, Structure and function, raising of anti-sera, Antigen-Antibody reaction. Lectins and their forensic significance.

**Serogenetic markers: Blood group:** History, Biochemistry and genetics of ABO, Rh, Mn and other systems, method of ABO blood grouping (absorption-inhibition. Mixed agglutination and absorption elution) from blood stains and other body fluids/stains viz. menstrual blood, semen, saliva, sweat, tear pus, vomit, hair, bone, nail, etc. blood group specific ABH substance, determination of secretors/non secretor status, Lewis antigen, Bombay blood group.

**Polymorphic enzymes typing-** PGM, ESD, EAP, AK, etc., and their forensic significance, HLA typing, role of serogenetic markers in individualization, paternity disputes etc.

  
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**UNIT IV:**

**Forensic Botany**

Various types of wood, timber varieties, seeds and leaves – their identification and matching. Diatoms – morphology, types, methods of isolation, and forensic importance. Identification of pollen grains.

**Forensic Entomology:** significance of terrestrial and aquatic insects in forensic investigations and their role in crime detection, insect's succession and its relationship to determine time since death.

**Forensic Odontology:** Definition pattern, structure of teeth, age determination- identification of person, role in mass disaster, disease of teeth and their significance in personal identification. Determination of Stature and sex from bones, Identification of burnt bones, recovery and identification of skeletal remains in accidental cases and mass disasters. Facial reconstruction.

**UNIT V:**

**DNA typing**

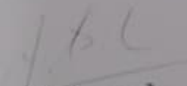
Structure of DNA, Damage to DNA, variation in DNA, DNA as excellent polymorphic markers

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

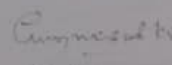
**DNA typing technique** – RFLP, PCR, Amplification, PCR based typing methods such as HLA DQA1 Amply- type<sup>(R)</sup> PM Polymarkers, D 1580, STR, Gender ID, mt- DNA methods with their merits and demerits. Comparison of RFLP and PCR based method, Forensic Significance of DNA Profiling.

**SUGGESTED READINGS:**

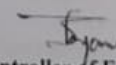
1. Albert's, B, Bray, D, Lewis, J, Roberts K & Watson, J.D; Molecular Biology of cell, 2<sup>nd</sup> ed. Garland Pub. New York
2. Biology Methods manual; Metropolitan Police Forensic Science Laboratory, London.
3. Daniel L. Hartl & Elizabeth W. Jones; Genetics- Principle & Analysis, 4th Ed., Jones & Bartlett Pub.
4. E.J. Gardner, M.I. Simmons and D.P. Snustad; Principles of Genetics; John Wiley, New York.
5. Edwin, H. Mc Caney-Human Genetics, The Molecular Revolution, Jones & Bartlett Pub. London.
6. H.G. Greenish & E. Collin; An anatomical Atlas of vegetable Powders; J&A Churchill, London
7. Herbert R. Mauersberger; Mathews Textile Fibers – their physical, Microscopic and chemical properties; John Wiley, New York.
8. Jaiprakash G. Shewale, Ray H. Liu Forensic DNA Analysis: Current Practices and Emerging Technologies, CRC Press.
9. John M Butler: Forensic DNA Typing. Elsevier Academic Press.


  
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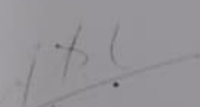
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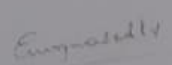
10. Keith Immen and Norah Rudus, An introduction to Forensic DNA Analysis. CRC Press, New York.
11. Kimball, John W; Biology; Arvind Publishing Co. New Delhi
12. Lee M.C. and Gaenesten, R.E: DNA and other Polymorphism in Forensic Science. Year book Medical Published.
13. P.L. Williams and R. Warwick; Gray's anatomy; Churchill Livingston, London.
14. R.P. Pandey, Plant Anatomy; S. Chand, new Delhi.
15. Richard Saferstein; Forensic Hand Book; Ed.; Prentic Hall, Englewood Cliff, New Jersey

**PRACTICALS:**

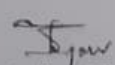
13. Preliminary and confirmatory examination of Blood
14. To Determine Species of Origin from Blood by Gel diffusion method
15. To determine the ABO and Rh factor of human blood.
16. Morphological examination of human and animal hairs
17. Preparation of slide for scale pattern study of hairs
18. Identification of species from the given hair sample.
19. Examination of given fibre by physical and chemical method.
20. Detection of salivary stains.
21. Identify the bones of human body.
22. Determine age and sex from long bones and skull.
23. To isolate and examine diatoms and classify them.
24. Isolation of microbial from air.
25. To extract DNA from different samples.
26. Any other related to the course


  
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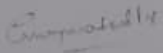
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
MSFSN303 DISSERTATION

Course Code	Course Name	TEACHING & EVALUATION SCHEME (Dissertation)					
		End Sem University Exam	Teachers Assessment*	L	T	P	Credit
MSFSN303	Dissertation	90	60	0	0	0	06

Every student will carry out dissertation under 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 Dissertation (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.

  
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