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

Choice Based Credit System (CBCS)
B. Sc. with Major Forensics Science - Batch (2023-27)
SEMESTER- III

FINGERPRINT EXAMINATION AND BIOMETRY

COURSE CODE	CATEGORY	COURSE NAME	THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
VOFS101	VC	Fingerprint Examination and Biometry	0	0	0	60	40	0	2	4	4

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.

Course Objectives: After studying this paper the students will know –
1. The historical development of fingerprint
2. The basic patterns and types of fingerprints
3. The different developing methods of fingerprint.
4. The impart knowledge of Basic Biometric System.
5. Concepts of Verification and Identification..
6. The classification of biometric processes.

Course Outcomes:
1. They student will be able acquainted with fingerprints and trace their origin.
2. They will be able to understand the pattern of fingerprints and their inner and outer terminus.
3. They will be able to develop the latent fingerprints using various techniques.
4. Student will be able to understand working of biometry
5. Student will know advances in Biometric system
6. Student will understand different Biometric systems

Unit 1: Basics of Fingerprinting
Introduction and history, with special reference to India. Biological basis of fingerprints. Formation of ridges. Fundamental principles of fingerprinting.

Unit 2: Fingerprint characteristics/minutiae.
Types of fingerprints, Fingerprint patterns, characteristics/minutiae of Fingerprint, Plain and rolled fingerprints. Classification and cataloguing of fingerprint record. Automated fingerprint Identification System. Significance of poroscopy and edgeoscopy.

Unit 3: Development of Fingerprints
Latent prints. Constituents of sweat residue. Latent fingerprints' detection by physical and chemical techniques. Mechanism of detection of fingerprints by different developing reagents.

Unit 4: Fundamental aspects of Biometrics
Definition, characteristics and operation of biometric system, Classification of biometric systems – physiological and behavioral, Strength and weakness of physiological and behavioral biometrics, Multimodal Biometrics.

Unit 5: Biometric Process
Key biometric processes – enrollment, identification and verification, sensor module, feature extraction module, database module, matching module, Positive and negative identification, Performance measures used in biometric systems – FAR, FRR, GAR, FTA, FTE and ATV, Biometric versus traditional technologies.

Practicals:
1. To record plain and rolled fingerprints.
2. To carry out ten digit classification of fingerprints.
3. To identify different fingerprint patterns.
4. To identify core and delta.
5. To carry out ridge tracing and ridge counting.

Suggested Reading-:
1. J.E. Cowger, Friction Ridge Skin, CRC Press, Boca Raton (1983).
2. D.A. Ashbaugh, Quantitative-Qualitative Friction Ridge Analysis, CRC Press, Boca Raton (2000).
3. C. Champod, C. Lennard, P. Margot an M. Stoilovic, Fingerprints and other Ridge Skin Impressions, CRC Press, Boca Raton (2004).
4. Lee and Gaensleen's, Advances in Fingerprint Technology, 3rd Edition, R.S. Ramotowski (Ed.), CRC Press, Boca Raton (2013).
5. S. Nanavati, M. Thieme and R. Nanavati, *Biometrics*, Wiley India Pvt. Ltd. (2002).
6. P. Reid, *Biometrics for Network Security*, New Delhi (2004).
7. J.R. Vacca, *Biometric Technologies and Verification Systems*, Butterworth-Heinemann, Oxford (2007).
8. Anil K. Jain, *Handbook of Biometrics*

Chairperson	Chairperson	Controller of Examination	Joint Registrar
Board of Studies- Forensic Science Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore	Faculty of Studies- Sciences Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore	Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore	Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

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