



SHRI VAISHNAV VIDHYAPEETH VISHVA VIDHYALAYA, INDORE
SHRI VAISHNAV INSTITUTE OF FORENSIC SCIENCE
GENERIC ELECTIVE
UNDER GRADUATE III SEMESTER

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*				
GEUFS303	GE	Forensic Engineering	60	20	20	00	00	4	0	0	4

Legends: L-Lecture; 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:

Students will be able to learn:

- The tools and techniques in forensic engineering.
- Arson and its technical investigation.
- Significance of nanotechnology and advanced technical method and their usefulness in justice system.

Course Outcomes:

After pursuing this paper the students will know:

- The role of engineering sciences in combating crime.
- The tools and techniques in forensic engineering
- Significance of nanotechnology and advanced technical method and their usefulness in justice system.



SHRI VAISHNAV VIDHYAPEETH VISHVA VIDHYALAYA, INDORE
SHRI VAISHNAV INSTITUTE OF FORENSIC SCIENCE
GENERIC ELECTIVE
UNDER GRADUATE III SEMESTER

UNIT-I

Tools and Techniques in Forensic Engineering –I

Steps involved in forensic engineering. Commonly used methods of investigation. Primary and secondary defects involved in failure of structure. Hypothesis testing for engineering aspects of forensic cases. Role of mechanical, electronics and computer engineers in forensic science.

UNIT-II

Tools and Techniques in Forensic Engineering –II

Accident investigations. Failure of signaling and control systems. Ergonomics. Applications of animations, simulations, and digital imaging in solving crime cases. Episodes involving fire engineering. Improving engineering designs after forensic engineering investigations.

UNIT-III

Nanoscience & Nanotechnology

Introduction to nanoparticles, nanotubes, utilization of nanotechnology in analysis of physical evidences, selectivity of nanoparticles with compatibility and feasibility, Application of nanotechnology in forensic evidence analysis.

UNIT-IV Arson:

Faults and failure of evidence of Arson & Fire due to electrical & mechanical faults/failure, Power Physics: Voltage, current generation and transmission, Current and Power Transformers, 3-phase electricity and Earth faults

UNIT-V

Advanced Physical Techniques and their application in Forensic Engineering:

Introduction to Lasers, Advanced microscopy & 3D scanning; Introduction to Atomic Absorption & Emission Spectroscopy, Fourier transform and X-ray spectroscopy Collision



SHRI VAISHNAV VIDHYAPEETH VISHVA VIDHYALAYA, INDORE
SHRI VAISHNAV INSTITUTE OF FORENSIC SCIENCE
GENERIC ELECTIVE
UNDER GRADUATE III SEMESTER

Investigation and Reconstruction: Causes and Prevention of Road Accidents, Liability to accidents, Communication on the road, Reconstruction and proactive measures.

Suggested Readings

1. J.F. Brown and K.S. Obenski, Forensic Engineering – Reconstruction of Accidents, C.C. Thomas, Springfield (1990).
2. K. Noon, Introduction to Forensic Engineering, CRC Press, Boca Raton(1992).
3. Harold Franck; “Forensic Engineering Fundamentals”, CRC Press, Taylorand Francis Group, 2013.
4. C P Poole Jr and Franks J Owens; “Introduction to Nanotechnology”, Wiley Interscience; 1st Ed, 2003.
5. Gary L. Lewis; “Guidelines for Forensic Engineering Practice”, ASCEPublications, 2003.
6. Kenneth L. Carper; “Forensic Engineering”, Second Edition, CRC Press,2001.