University of Kerala

Discipline	**PHYSICS**				
Course Code	**UK2MDCPHY103**				
Course Title	**FOUNDATIONS IN FORENSIC SCIENCE**				
Type of Course	**MDC**				
Semester	**II**				
Academic Level	**100 - 199**				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours/Week
	3	3 Hrs	-	-	3 Hrs
Pre-requisites					
Course Summary	The "Foundations in Forensic Science" course is a comprehensive and interdisciplinary exploration of key areas in forensic investigation. Through this course, students can delve into the fundamental principles and techniques essential to modern forensic science. Beginning with an overview of forensic science's role in crime investigation, students progress to mastering crime scene management, evidence collection, and preservation. They then explore the analysis of various types of physical evidence and their forensic significance. The course culminates in a study of firearms and their crucial role in criminal investigation.				

BOOKS FOR STUDY:

1. Criminalistics: An Introduction to Forensic Science, Richard Saferstein, (12/e), Pearson Education Inc.
2. Forensic Science in Criminal Investigation and trials, Dr. BR.Sharma, (4/e), Universal Law Publishing Co. Pvt. Ltd.

BOOKS FOR REFERENCE:

1. Crime Investigation, Paul L Kirk, Wiley
2. Solving Crimes with Physics, Carla Miller Nozigia, Mason Crest Publishers
3. Beginners Forensic Science, Dr. C. Hegde & Dr. R. Shekhar, Himalaya Publishing House.
4. Crime Scene Forensics: A Scientific Method Approach, Robert C Shaler, CRC Press
5. Fundamentals of Forensic Science, Max M. Houck & Jay A. Siegel, Elsivier Science.

DETAILED SYLLABUS: THEORY

Module	Unit	Content	Hrs	CO No
I	**Science in Criminal Justice System [sec 1,2,4,5 Book 1: Chapter 1; sec 3 Book 2: Chapter 1]**		**9**	
	1	Definition and Scope of Forensic Science	1	1
	2	History and Development of Forensic Science	1	1
	3	Basic principles of Forensic Science	2	1
	4	Services of Criminal Laboratories - Basic Services Provided by Full Service Crime laboratories, Optional Services Provided by Full Service Crime Laboratories.	2	1
	5	Functions of Forensic Scientist - Analysis of Physical Evidence, The Importance of Physical Evidence, Determining Admissibility of Evidence, Providing Expert Testimony.	3	1
II	**The Crime Scene [Book 1: Chapter 2]**		**9**	
	6	Processing the Crime Scene - Securing and Isolating the Crime Scene, Recording the Crime Scene, Conducting a Systematic Search for Evidence.	5	2
	7	Collecting and Packaging of Physical Evidence - Collecting Physical Evidence, Handling Evidence, Packaging Evidence.	2	2
	8	Maintaining the Chain of Custody - Obtaining Standard/Reference Samples, Submitting Evidence to the Laboratory.	1	2
	9	Ensuring the Crime Scene Safety	1	2
III	**Physical Evidence [Book 1: Chapter 3 (sec 10 & 11), Chapter 4 (sec 12)]**		**9**	
	10	Common Types of Physical Evidence	1	3

	11	The Significance of Physical Evidence -Identification, Comparison, Individual Characteristics, Class Characteristics, Assessing the Value of Physical Evidence, Cautions and Limitations in Dealing with Physical Evidence.	5	3
	12	Crime Scene Reconstruction - Principles of Crime- Scene Reconstruction, Personnel Involved in Reconstruction.	3	3
IV	**Micro-Traces [Book 2: Chapter 17]**		**9**	4
	13	Importance	1	4
	14	Nature -Plant Materials, Dust, Fibres, Polymers, Minerals, Glass, Paint, Soil, mMaterials of Animal Origin.	1	4
	15	Location - The Culprit, Victim, Crime Scene, Weapon, Vehicle, Location, Techniques.	1	4
	16	Collection - Handpicking, Taping, Tacuuming, Dissolving and Washing, Scraping.	1	4
	17	Forensic Problems	1	4
	18	Evaluation -Tools and Techniques, Microscopy, Micro Chemical Tests, X-ray Diffraction, Micro-FTIR Spectroscopy.	2	4
	19	Example of a Specific Trace Evidence - Glass - Importance, Nature, Location, Evaluation.	2	4
V*	**Firearms [Book 2: Chapter 9]**		**9**	
	20	Importance	1	5
	21	Nature - Firearms, Firearm Parts, Classifications, Single Shot Firearms, Repeaters, Ammunition, The Firing Process.	5	5
	22	Location - The Victim, the Culprit, the Scene of Occurrence, the Firearm, the Ammunition.	3	5

COURSE OUTCOMES

No.	Upon completion of the course the graduate will be able to	Cognitive Level	PSO addressed
CO-1	Describe the services of a typical comprehensive crime laboratory and forensic scientist in a criminal justice system	R, U	PSO 2, 3

CO-2	Describe the various measures taken while securing, recording and searching the crime scene as well as describe the proper techniques for packaging common types of physical evidence.	R, U	PSO 2, 3
CO-3	Summarize the common types and significance of physical evidence encountered at crime scenes as well as the principles of crime scene reconstruction.	R, U	PSO 2, 3, 6
CO-4	Demonstrate the physical evidence related to crimes involving microtraces.	R, U	PSO 2,3, 7
CO-5	Demonstrate the physical evidences related to crimes involving firearms.	R, U,	PSO 2,3, 7

R-Remember, U-Understand, Ap-Apply, An-Analyse, E-Evaluate, C-Create

Name of the Course: FOUNDATIONS IN FORENSIC SCIENCE

Credits: 3:0:0 (Lecture: Tutorial: Practical)

CO No.	CO	PO / PSO	Cognitive Level	Knowledge Category	Lecture (L)/ Tutorial (T)	Practical (P)
CO-1	Describe the services of a typical comprehensive crime laboratory and forensic scientist in a criminal justice system	PO- 1 PSO - 2, 3	R, U	F, C	L/T	-
CO-2	Describe the various measures taken while securing, recording and searching the crime scene as well as describe the proper techniques for packaging common types of physical evidence.	PO- 1, 3, 6 PSO - 2, 3	R, U	F, C	L/T	-
CO-3	Summarize the common types and significance of	PO- 1, 2, 3, 6	R, U	F, C, P	L/T	-

	physical evidence encountered at crime scenes as well as the principles of crime scene reconstruction.	PSO - 2, 3				
CO-4	Demonstrate the physical evidence related to crimes involving microtraces.	PO- 1, 2,3, 6 PSO - 2, 3, 7	R, U	F, C, P	L/T	-
CO-5	Demonstrate the physical evidences related to crimes involving firearms.	PO- 1, 2, 6 PSO - 2, 3, 7	R, U	F, C	L/T	-

F-Factual, C- Conceptual, P-Procedural, M-Metacognitive

Mapping of COs with PSOs and POs :

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO-1	-	1	1	-	-	-	-	1	-	-	-	-	-	-	-
CO-2	-	2	1	-	-	-	-	2	-	1	-	-	2	-	-
CO-3	-	3	1	-	-	-	-	3	2	2	-	-	2	-	-
CO-4	-	3	3	-	-	-	2	1	3	1	-	-	2	-	-
CO-5	-	3	3	-	-	-	2	1	3	-	-	-	2	-	-

Correlation Levels:

Level	-	1	2	3
Correlation	Nil	Slightly / Low	Moderate / Medium	Substantial / High

Assessment Rubrics:

- Quiz / Assignment/ Discussion / Seminar
- Midterm Exam
- Programming Assignments
- Final Exam

Mapping of COs to Assessment Rubrics:

CO No	Internal Exam	Assignment	Project Evaluation	End Semester Examinations
CO-1	✓	✓	-	✓
CO-2	✓	✓	-	✓
CO-3	✓	-	-	✓
CO-4	✓	-	-	✓
CO-5	✓	✓	-	-