COURSE OF STUDIES

for

Master of Philosophy

in

<Forensic Medicine>

UNIVERSITY OF HEALTH SCIENCES, LAHORE PAKISTAN

Program Rationale:

The rationale for the M.Phil. program in Forensic Medicine stems from the imperative to offer an interdisciplinary platform, uniquely designed to equip students for impactful roles in medical teaching institutes and forensic medicine laboratories. This program aims to meet dual objectives: to cultivate postgraduates proficient in conducting casework examinations as forensic experts and to provide an avenue for advanced scientific education for those inclined towards pursuing research degrees.

Mission Statement:

M.Phil. in Forensic Medicine will be an interdisciplinary program designed to prepare students for careers in medical teaching institutes and forensic medicine laboratories. The goals and objectives of this program are to produce postgraduates that can work as forensic experts conducting casework examinations or to provide advanced scientific education to students interested in continuing their education towards a research degree. The proposed objectives are consistent with the mission of University of Health Sciences and accreditation standards of the Higher Education Commission of Pakistan (HEC).

Program Educational Objectives:

The objective of M.Phil. Program in Forensic Medicine is:

1. To produce technically skilled and educated postgraduates with foundation in the scientific and laboratory problem solving skills required for solving cases involving Forensic Medicine.
2. Upon completion of the program, graduates will be prepared to function as experts in Forensic Medicine; they can also choose to continue their career in teaching and training through improving their research skills.
3. Graduates of the program will have unique opportunity to undertake original research and gain in-depth knowledge in their chosen area of forensic medicine and toxicology.

4. This will allow them to get a chance of employment in Federal/Provincial crime laboratories and medical teaching institutes.
5. Our graduates will have careers in several forensic medicine fields. Examples include forensic scientists in DNA, toxicology, Trace-chemistry and Crime Scene Investigation at Punjab Forensic Science Agency, Lahore and Medical institutes, and Surgeon Medicolegal Punjab.

Program Learning Outcomes:

Students should be able to:

1. Synthesize empirical and theoretical knowledge from the Natural Sciences Core, Forensic Core, Criminal Justice, and laboratory science courses as well.
2. Demonstrate competency in performing laboratory analysis of biological samples, crime scene investigation, and evidence documentation.
3. Demonstrate the acquisition of skills and experiences in the application of basic forensic medicine concepts and knowledge to solve the problem.
4. Exhibit an orientation in professional values and concepts of ethics appropriate to the area of forensic medicine and law.
5. Demonstrate the integration of knowledge and skills through a capstone experience.
6. Exhibit excellent written and oral communication skills.
7. Demonstrate knowledge for the issues specifically related to forensic medicine.
8. To promote partnerships with academic and operational forensic medicine organizations both nationally and internationally.
9. To enhance the forensic community through continuing education and professional development.

   Other objectives may include:

   - Problem-solving skills
   - Science skills
   - Detail oriented
   - Critical-thinking skills

SCHEME OF STUDIES (2-Year)

MS/MPhil Forensic Medicine

Semester #	Course code	Course title	Credit hours		
			Theory	Practical	Total
1		Biostatistics and Research Methodology	2	0	2
	FM-701-I	Forensic Medicine I	2	1	8
	FM-702	Fundamentals of Forensic Sciences	2	1	
	FS-702	Forensic Genetics	2	0	
		Elective Course	2	0	2
	FM-705	Forensic Serology and Biology			
	FS-704	Forensic Biochemistry			
2	FM-703	Artificial Intelligence (AI) in Forensic Investigations	2	1	8
	FM-704	Comprehensive Approaches to Medicolegal Examination	2	1	
	FM-701-II	Forensic Medicine II	2	0	
		Elective Course	2	0	2
	FM-707	Firearm and Tool Marks			
	FM708	Nano Forensics			
3	Research (thesis)		6		6
4	Professional & Teaching Skills Apprenticeship (PTSA)		2		2
					(Total: 30)

Course Title: Forensic Medicine I

Contact Hours:	Credit Hours:
Theory = 30	Theory = 02
Practical = 15	Practical = 01
Total = 45	Total = 03

Course Objective:

The objectives of this course will help students in learning basic types of injuries, cause of injury and their role in death scene investigations.

Learning Outcome:

Throughout the course, students will develop a comprehensive understanding of various types of injuries, including blunt force, sharp force, and thermal injuries. This knowledge will enable them to analyze and determine the cause of injuries, drawing on principles from anatomy, physiology, and forensic science. Moreover, students will grasp the pivotal role of injuries in death scene investigations, learning to connect the nature and pattern of injuries to potential causes of death.

Course Outline:

Introduction to Forensic Medicine; Injuries: Types and classification of injuries, anti-mortem and post-mortem injuries, aging of injuries, artificial injuries.; Forensic Toxicology: Introduction, Role of the toxicologist, significance of toxicological findings, poisons, definition, classification based on their origin, physiological action and chemical nature, poisons and poisoning.; Introduction to Autopsy. Death: Introduction to death, Causes of death, determination of time since death, medico legal aspects of death investigation,

types of deaths, Personal Identification; Abortion; General study and Isolation techniques of toxins, drugs, Volatile poisons, vegetable poisons. Principles and procedures of medicolegal death investigation. Postmortem examination techniques, including external and internal examination. Interpretation and documentation of autopsy findings. Forensic Research Methodologies: Medicolegal death investigation research, Innovations in postmortem techniques, Advancements in forensic toxicology.

Practical:

Sample Preparation and Presumptive Tests, Sample Extraction and Thin Layer Chromatography, Immunoassays, Spectrophotometry.

Recommended Books:

1. Casarett & Doull's Toxicology: The Basic Science of Poisons by Curtis D. Klaassen. Publisher: McGraw-Hill Professional; 7th edition (2007).
2. Principles of Forensic Toxicology, 3rd Edition Author: Barry Levine Publisher: AACC Press; 3rd edition (January 4, 2010) ISBN: 1594250960
3. Clarke's Analytical Forensic Toxicology; Sue Jickells and Adam Negrusz, 2nd ed.; Pharmaceutical Press; 2013; ISBN 978-0-85369-705-3
4. Textbook of Forensic Medicine and Toxicology Textbook by Nagesh Kumar Rao
5. Textbook of Forensic Medicine and Toxicology: Principles and Practice Textbook by Krishan Vi.

Course Title: Fundamentals of Forensic Sciences

Contact Hours:	Credit Hours:
Theory = 30	Theory = 02
Practical = 15	Practical = 01
Total = 45	Total = 03

Course Objective:

To provide students with a fundamental understanding of the principles, methodologies, and applications of forensic sciences, encompassing various disciplines such as crime scene investigation, forensic laboratory analysis, forensic biology, forensic chemistry, and forensic evidence interpretation.

Learning Outcome:

The course aims to provide students with a foundational understanding of forensic sciences, covering principles, methodologies, and applications in disciplines such as crime scene investigation, forensic laboratory analysis, biology, chemistry, and evidence interpretation. Graduates will develop analytical skills, integrate insights across forensic disciplines, cultivate critical thinking, and foster ethical competence in evidence handling.

Course Outline:

Introduction to Forensic Science, Brief history, Crime Scene Investigation, The Nature of Evidence, Branches of Forensic Science , Forensic Biology, Forensic Chemistry, Forensic Toxicology, Forensic Pathology, Crime Scene Investigation, Odontology, Entomology, Fingerprints, Questioned Document Analysis, DNA Analysis, Forensic Hair Examinations , Illicit Drugs, Forensic Toxicology, Development of a Forensic Science

Laboratory, Impressions analysis, Fingerprints analysis, Firearm and tool marks, Blood Pattern Analysis, Drugs, Forensic Toxicology, Trace Evidence – Hairs and Fibers analysis, Trace Evidence – Paint, Glass, and Soil analysis. Crime Scene Equipment, Photography, Crime Scene Sketching, Measurements & Note taking, Footwear/Tire Track Evidence at the Crime Scene, Friction ridges, Impression evidence, Blood splatter patterns, Drug Evidence at the Crime Scene, Digital Evidence at the Crime Scene.

Practical:

Evidence Collection, ALS Examinations/Photography, Fingerprints, Impressions, Bloodstain Pattern Analysis. Bloodstain Pattern Analysis.

Recommended Books:

1. Houk, M & Siegel, J (2015). Fundamentals of Forensic Science (3rd Edition/e). New York Elsevier (Latest Edition).
2. Richard Saferstein (2015). Criminalistics: An Introduction to Forensic Science (11th/e). New York Pearson (Latest Edition).
3. Durnal, Evan W. "Crime scene investigation" Forensic Science International 199.1-3 (2010): 1-5.
4. Faggiano, Vincent, et al. Techniques of crime scene investigation. crc Press, 2003.
5. The Forensic Casebook: The Science of Crime Scene Investigation Book by Ngaire Genge
6. Forensic Science: Crime Scene Analysis Paperback – May 30, 2014 by Mr David Elio Malocco
7. Silent Witnesses: The Often Gruesome but Always Fascinating History of Forensic Science by Nigel McCrery

Course Title: Forensic Genetics

Contact Hours:	Credit Hours:
Theory = 30	Theory = 02
Practical = 0	Practical = 0
Total = 30	Total = 02

Course Objective:

To understand the basic concepts of genetics, explain structure of chromosome and hereditary characteristics, understand the process of cell division, explain Mendel's laws, characterize modifications of Mendelian ratios, know the types of genetic variation, understand population genetics, and understand the importance of genetics in Forensic Sciences.

Learning Outcome:

The course on forensic genetics is designed to provide students with a comprehensive understanding of key genetic concepts. Students will delve into the intricate structure of chromosomes and the transmission of hereditary characteristics. The processes of cell division will be explored, emphasizing their significance in genetic inheritance.

Course Outline:

DNA structure and organization in chromosomes, mitosis and meiosis, Mendelian genetics, extensions of Mendelian genetics, gene mutations, Sex determination and sex chromosomes, chromosome mutations: variation in number and arrangement, extranuclear inheritance, Hardy-Weinberg Law.

Recommended Books:

1. Human Genetics: concepts and applications by Ricki Lewis
2. Concepts of genetics (11th edition) by William S. Klug, Pearso

Course Title: Artificial Intelligence (AI) in Forensic Investigations

Contact Hours:	Credit Hours:
Theory = 30	Theory = 02
Practical = 15	Practical = 01
Total = 45	Total = 03

Course Objective:

This course aims to provide students with a comprehensive understanding of the potential integration of technology in the fields of forensic medicine and forensic sciences. Participants will explore various technological advancements and their applications in medico-legal autopsy, forensic toxicology, crime scene investigation, and disaster victim identification (DVI). The course will cover topics such as enhancing autopsy procedures through technological tools, leveraging technology for in-depth forensic analysis, and streamlining disaster victim identification processes using cutting-edge methods.

Learning Outcome:

Upon completion of this course, students will emerge equipped with a broad understanding of the potential applications of technology in forensic medicine and forensic sciences. Exploring various technological advancements, participants will gain specific knowledge of how technology can enhance medico-legal autopsy procedures, forensic toxicology analyses, crime scene investigations, and disaster victim identification (DVI) processes.

Course Outline:

An exploration of the historical evolution of technology within the context of forensic medicine and forensic sciences, specific applications of technology in medico-legal autopsy procedures, forensic toxicology, crime scene investigation, and disaster victim identification (DVI), utilization of technology in disaster victim identification (DVI), ethical considerations and legal frameworks pertinent to technological applications in forensic contexts, fundamentals of technology for autopsy procedures, application of technology in analyzing forensic evidence and toxic substances, exploration of current research and emerging trends, interdisciplinary nature of technology in forensic sciences, use of technology for evidence examination, cause of death determination, and the integration of advanced imaging technologies.

Practical:

Introduction to popular technological tools and platforms. Digital autopsy simulation software or virtual platforms to simulate technology-enhanced autopsy procedures (open source). Application of technology for data analysis. Application of technology to analyze forensic evidence and interpret findings at crime scenes.

Recommended Books:

1. Topol, E. (2019). Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again.
2. Müller, V. C., & Haynes, N. (Eds.). (2018). Ethics of Artificial Intelligence and Robotics: A Handbook of Current and Future Developments.
3. Hayes, A. W., & Kruger, C. A. (2014). "Toxicology: Principles and Applications.

Course Title: Comprehensive Approaches to Medicolegal Examination

Contact Hours:	Credit Hours:
Theory = 30	Theory = 02
Practical = 15	Practical = 01
Total = 45	Total = 03

Course Objective:

The objectives of the course on Advanced Postmortem Investigations encompass a multifaceted approach to medicolegal examination. Students will delve into advanced techniques for conducting postmortem examinations, gaining a comprehensive understanding of the intricacies involved in forensic pathology.

Learning Outcome:

Students will showcase in-depth knowledge and skills in postmortem examinations, emphasizing a systematic and comprehensive approach to forensic pathology. Students will exhibit competence in the meticulous external and internal examination of deceased individuals, including the adept collection and preservation of pertinent specimens.

Course Outline:

Advanced Methods in Postmortem Investigation, Autopsy protocols and types, External and internal examination procedures, Specimen collection and preservation techniques, Exhumation laws, precautions, and procedures, Histochemical and biochemical methods for age determination of wounds, Burns and their medico-legal importance, Electrocaution and its medico-legal importance, Postmortem toxicological analysis of blood, saliva, and

semen, Determination of physical appearance, Determination of personality traits and Research and innovation in forensic methodologies.

Practical:

Infection control, safety guidelines, external examination, documentation, and photography of injuries. Techniques for collecting and preserving samples are covered, along with documentation/report writing. Case discussions aid interpretation, focusing on preservation methods, biological stain analysis, ABO blood grouping, DNA estimation, and computer software for DNA analysis. The practical segment concludes with hands-on experience in agarose gel electrophoresis, providing essential skills in advanced forensic techniques.

Recommended Books:

4. Gordon Shipiro, Forensic Medicine, Churchill Livingstone Latest Ed.
5. C.J. Poison Essential of forensic medicine, Paragon Press Oxford latest Ed.
6. Richard Li. Forensic biology. 2008. CRC Press/Taylor & Francis
7. John M. Butler. Fundamentals of Forensic DNA Typing. Elsevier Publications, New York
8. John M. Butler. Forensic DNA Typing, Second Edition: Biology, Technology, and Genetics of STR Markers. 2005. Academic Press
9. Post Mortem Examinations and Case Books: Date(s) 1840-1946 (Creation) St George's Hospital, London

Course Title: Forensic Medicine II

Contact Hours:	Credit Hours:
Theory = 30	Theory = 02
Practical = 00	Practical = 00
Total = 30	Total = 02

Course Objective:

The objectives of this course will help students in learning comprehensive knowledge and understanding of the principles and practices of traumatology, the legal and medical aspects of sexual offences, and the intricacies of legal proceedings related to these issues.

Learning Outcome:

Throughout the course, students will develop a comprehensive understanding to demonstrate a thorough understanding of the principles and practices of traumatology, including the assessment and management of trauma patients. They will gain in-depth knowledge of the legal and medical aspects of sexual offences, enabling them to approach these cases with sensitivity and accuracy. Additionally, students will develop the skills necessary to navigate legal proceedings, understanding the roles and responsibilities of medical professionals in a legal context, preparing reports, and providing expert testimony when required. This comprehensive skill set will prepare students to effectively contribute to both medical and legal aspects of their professional practice.

Course Outline:

Introduction to traumatology, scope, and historical perspective. types of trauma, the protocols for assessing and managing trauma patients. Sexual offences, types, epidemiology, and prevalence. The medical and psychological impacts on survivors, along with the immediate and long-term effects. Procedures for conducting forensic medical examinations, collecting and preserving evidence, and providing medical and psychological care. Legal reporting and confidentiality. Legal proceedings related to sexual offence cases, an overview of relevant laws and the roles and responsibilities of medical professionals in these contexts. understanding the requirements for legal documentation, techniques for effective courtroom testimony. ethical considerations.

Recommended Books:

1. Casarett & Doull's Toxicology: The Basic Science of Poisons by Curtis D. Klaassen. Publisher: McGraw-Hill Professional; 7th edition (2007).
2. Principles of Forensic Toxicology, 3rd Edition Author: Barry Levine Publisher: AACC Press; 3rd edition (January 4, 2010) ISBN: 1594250960
3. Textbook of Forensic Medicine and Toxicology Textbook by Nagesh Kumar Rao
4. Textbook of Forensic Medicine and Toxicology: Principles and Practice Textbook by Krishan Vi.

Elective Courses

Course Title: Forensic Serology and Biology

Contact Hours:	Credit Hours:
Theory = 30	Theory = 02
Practical = 00	Practical = 00
Total = 30	Total = 02

Course Objective:

The objectives of the forensic serology and biology course encompass a comprehensive exploration of biological evidence in forensic investigations. Students will develop a profound understanding of the principles and significance of biological materials, with a specific focus on the identification of body fluids and DNA in criminal investigations. The course aims to instill proficiency in the analysis and interpretation of various biological evidence, covering a broad spectrum from crime scene investigation to laboratory analysis. Emphasis will be placed on applying forensic techniques with precision and reliability, ensuring students are well-equipped to contribute effectively to the field of forensic serology and biology.

Learning Outcome:

Upon Completion of course the students will be able to: Comprehend the basic techniques and protocols used in serology of body fluids, Know and comprehend the medico-legal aspects of serology in disputed paternity and maternity cases, mass disaster and identification of criminals, Different techniques used in forensic biology, Different biological markers used for forensic purpose.

Course Outline:

Introduction, biological evidence and its type, identification of blood, species identification, identification of semen, semen analysis in rape and other sexually related crimes, identification of saliva, analyzing blood stains and stain patterns, locating, collecting and preserving blood evidence, recent advances in forensic serology, application of forensic serology for disputed paternity and maternity cases and cases of mass disaster and calamities, Introduction, Blood cells and blood typing, Methods for detecting blood, Confirming the presence of blood, Species Identification, Bloodstain pattern analysis, Post mortem toxicological analysis of blood, Saliva and semen, identification of Semen, identification of Saliva and Other Biological fluids, The structure of DNA, DNA sampling, Sources of DNA Evidence, DNA Electrophoresis, Detection Methods, Variable Number Tandem Repeat Profiling, Polymerase chain reaction, Short tandem repeat markers, DNA profiling, Single nucleotide polymorphism markers, Determination of ethnicity, Determination of physical appearance, Determination of personality traits, Mitochondrial DNA, Autosomal STR Profiling, Y Chromosome Profiling and Gender Typing, Single Nucleotide Polymorphism Profiling, Mitochondrial DNA Profiling.

Recommended Books:

1. Gordon Shipiro, Forensic Medicine, Churchill Livingstone Latest Ed.
2. C.J. Poison Essential of forensic medicine, Paragon Press Oxford latest Ed.
3. Richard Li. Forensic biology. 2008. CRC Press/Taylor & Francis
4. John M. Butler. Fundamentals of Forensic DNA Typing. Elsevier Publications, New York
5. John M. Butler. Forensic DNA Typing, Second Edition: Biology, Technology, and Genetics of STR Markers. 2005. Academic Press

Course Title: Forensic Biochemistry

Contact Hours:	Credit Hours:
Theory = 30	Theory = 02
Practical = 0	Practical = 0
Total = 30	Total = 02

Course Objective:

This course will provide an understanding of the principles and practical applications of some of the main analytical techniques found in a Forensic laboratory. The objective is to develop an understanding of a wide range of techniques, including microscopy and X-ray and chemical techniques; to examine their practical application and the interpretation of their results; to understand the advantages and disadvantages of the different techniques and their use in the identification and characterization of materials.

Learning Outcome:

Students will be able to learn how analytical techniques can be used in Forensic investigation in a rational and intelligent way.

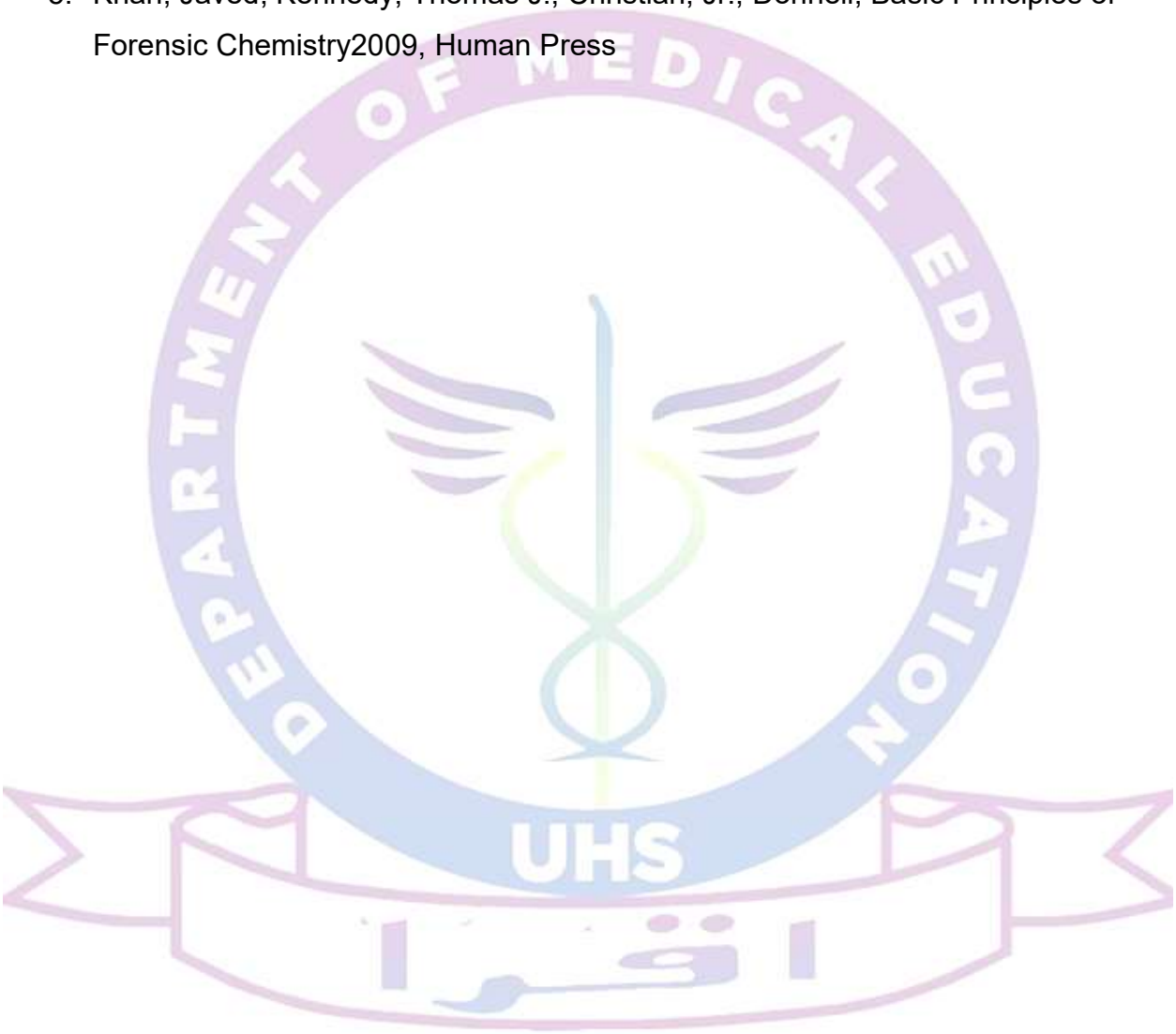
Course Outline:

The chemistry of Forensic evidence. Preliminary tests. Microscopic techniques. Analytical techniques for detection of drugs & poisons. Principles of modern techniques like Spectrophotometry, Flame photometry, Chromatography, & Electrophoresis.

Recommended Books:

1. Stuart, Barbara H. Forensic analytical techniques. John Wiley & Sons, 2012.

2. Nigrini, Mark J. Forensic analytics: Methods and techniques for forensic accounting investigations. John Wiley & Sons, 2020.
3. Bell, Suzanne, Forensic Chemistry, 1st Edition, 2006, Prentice Hall,
4. Jackson, Andrew R. W. and Julie M. Jackson, Forensic Science, 2004 1st Edition Prentice Hall
5. Khan, Javed, Kennedy, Thomas J., Christian, Jr., Donnell, Basic Principles of Forensic Chemistry2009, Human Press



Course Title: Firearm and Tool marks

Contact Hours:	Credit Hours:
Theory = 30	Theory = 02
Practical = 00	Practical = 00
Total = 30	Total = 02

Course Objective:

Study of firearm identification with the use of laboratory examination. The subject gives emphasis on the study of ammunitions, projectiles, gunpowder, primer and explosives, including the use of the bullet comparison microscope. It also deals with the principles in the microscopic and macroscopic examination of firearm evidence and the preparation of reports for legal proceedings in the solution of cases involving firearms.

Learning Outcome:

Upon successful completion of the "Firearm and Tool Marks" course, students will emerge with a comprehensive set of skills and knowledge crucial for the analysis and interpretation of firearm-related evidence. They will demonstrate a deep understanding of firearm design, functionality, and manufacturing processes, enabling accurate identification and classification of different types of firearms. Proficiency in the analysis of tool marks will empower graduates to link such marks to specific tools and assess their evidentiary value. Competence in the examination of firearms and ammunition components, including rifling characteristics and firing pin impressions, will be a hallmark of their expertise.

Course Outline:

Introduction to Forensic Ballistics, Origin and development of firearm, Concept of Ballistics, Classification and component parts of firearm, ammunitions bullets, cartridge cases, and gun powder, Nomenclature, mechanics and functions of various types of firearms, Barrel making, Breech face manufacturing, Arms manufacturing processes related to firearms, Preliminary Firearm Investigation, Methods of search for ballistics, Evidence obtained from examination of the wound, Distinguish a gunshot wound from one not caused by firearms, Advance firearm Identification, Cartridge collection and ballistics record, Rifling marks on bullet, Determining the type of weapon from a cartridge case found at the scene of the crime, Prepare bullets for photography, Firearm Investigation, Methods for Ballistics exhibits, Recognition of physical evidence, Ballistic Report Writing, Preparation of a report and Construct written report or ballistics report.

Recommended Books:

1. Grimares, Erdulfo M. (2006) Forensic Ballistics, Wisemans Books Trading
2. Montojo, Felipe G. (2006) Firearms Identification: Lesson for Criminology
3. Students. Mandaluyong: National Book Store

Course Title: Nano Forensics

Contact Hours:	Credit Hours:
Theory = 30	Theory = 02
Practical = 00	Practical = 00
Total = 30	Total = 02

Course Objective:

To acquaint the students with key integrative technologies and use of nanoparticles in Forensic Sciences.

Learning Outcome:

The course "Nanoforensics" aims to familiarize students with the integration of nanotechnology in Forensic Sciences. Through this course, students will delve into the core principles of nanotechnology and its intersection with forensic investigation techniques. They will explore the use of nanomaterials in biodetection, enhancing sensitivity and specificity in forensic analysis.

Course Outline:

A brief introduction to Nanotechnology, Interface between Nanotechnology and Forensic Sciences, Nanomaterials based bio detection, Role of nanoparticles in fingerprints development, Testing of illicit drugs, Role of quantum dots in volatile poisons detection, Current challenges and future perspective of nanotechnology in forensic investigation, Future prospect of Nanobiotechnology.

Recommended Books:

1. “Nano-Forensics” by Muhammad Akhyar Farrukh (2013). Published by LAMBERT Academic Publishing.
2. “Nanosensors: Theory and Applications in Industry, Healthcare and Defense” by Teik-Cheng Lim (2010). Published by CRC Press.
3. “Introduction of forensic nanotechnology as future armour” by Ritesh Kumar Shukla and Alok Pandya (2019). Published by ANOVA.

Course Title: Professional & Teaching Skills Apprenticeship (PTSA)

Credit Hours:02

Professional Skills Apprenticeship credit hours: 01

Teaching Skills Apprenticeship credit hours (CMT): 01

Professional Skills Apprenticeship:

Course Objective:

The Professional & Teaching Skills Apprenticeship (PTSA) in Forensic Sciences is a dynamic program designed to equip students with advanced professional and teaching skills. The course integrates theoretical knowledge with hands-on practical training to prepare students for multifaceted roles in forensic sciences.

Learning Outcome:

Upon completion of the Forensic Sciences PTSA course, students will emerge with advanced professional skills, effective teaching capabilities, and a foundation in conducting impactful research. The PTSA model ensures a holistic approach to skill development, preparing students for versatile and leadership roles in forensic sciences practice, academia, and research.

Practical Training:

The course will also include hands-on experience in serological body fluid analysis, microscopic examination of trace samples, development of fingerprints, and drugs detection methods.

Serological Body Fluid Analysis: Students will gain proficiency in identifying and analyzing various body fluids using serological techniques.

Microscope of Trace Samples: Practical exercises involving the use of microscopes for the examination of trace samples, emphasizing attention to detail and accurate analysis.

Fingerprints Development: Hands-on experience in developing and analyzing fingerprints, employing various enhancement methods.

Drugs Detection: Training in the detection and analysis of drugs, including methods for identifying controlled substances and interpreting toxicological findings.

Assessment:

Assessment will be multifaceted, encompassing practical skills in crime scene investigation, forensic laboratory analysis, and teaching effectiveness. Continuous feedback and reflective practices will be integrated to facilitate ongoing improvement.

Final Project:

Students will undertake a comprehensive final project, demonstrating the integration of professional, teaching, and research skills. This may include designing a teaching module, conducting a research study, or presenting an analysis of a complex forensic case.

Tasks:

1. Students will review and practice lab safety protocols, including the use of personal protective equipment (PPE), chemical handling, and biological hazard management.
2. Regular training on lab safety protocols, emergency procedures, and the proper use of equipment to prevent accidents and ensure a safe working environment.
3. Students will learn proper techniques for sample collection, labeling, and storage to maintain sample integrity.

4. Students will document the chain of custody for forensic samples collected during practical exercises.
5. Students will practice secure storage techniques for forensic samples, ensuring they are kept in restricted-access areas and documenting all handling and storage actions.
6. Students will analyze case studies involving various body fluids found at crime scenes. They will identify the type of body fluid, describe the serological techniques used, and interpret the results.
7. Students will collect trace samples from mock crime scenes and prepare slides for microscopic examination.
8. Students will collect fingerprint samples using various techniques such as dusting, lifting, and chemical development.
9. Students will learn and apply techniques for identifying controlled substances. This will include practical sessions on spot tests, chromatography, and spectroscopy.
10. Students will engage in role-playing exercises to practice professional communication in various forensic contexts, including courtroom testimony and interdisciplinary collaboration.
11. Students will analyse case files of deaths in police cutody/custodial deaths

Teaching Skills Apprenticeship

All students of M Phil programme will get registered for the CMT Certification in the final semester. Completing the course work and successfully getting certified for CMT, which is a patent of UHS, will be a compulsory integral component of PTSA (Professional and Teaching Skills Apprenticeship) for the 4th semester of all M Phil programs at UHS.