Forensic Toxicology: Current Trends and Challenges Training Course

Professional Development Training Course Outline

Category	Criminology	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The ever-evolving field of forensic toxicology plays a pivotal role in modern criminal investigations, drug monitoring, and postmortem analyses. As legal systems across the globe become increasingly reliant on scientific evidence, toxicologists are expected to stay updated with the latest technological advancements, emerging psychoactive substances (NPS), and analytical methodologies. Training Course on Forensic Toxicology: Current Trends & Challenges is expertly designed to equip professionals with cutting-edge knowledge, practical skills, and case-driven insights in forensic toxicology.

With global increases in drug-related fatalities, doping in sports, and chemical exposures, forensic toxicologists are now required to address legal, medical, and public health concerns with precision. This course offers a comprehensive understanding of toxicological screening, instrumental analysis (GC-MS, LC-MS/MS), toxicokinetics, and interpretation of results. Through real-world case studies and expert instruction, participants will enhance their competence to solve complex forensic challenges in diverse investigative contexts.

Programme Curriculum

Forensic Toxicology: Current Trends and Challenges Training Course

Introduction

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Course Objectives

1. Understand the fundamentals of forensic toxicology and its legal significance.
2. Explore emerging drug trends, including novel psychoactive substances (NPS) and designer drugs.
3. Master analytical techniques: GC-MS, LC-MS/MS, immunoassays, and spectroscopy.
4. Develop skills in toxicological interpretation for medicolegal cases.
5. Examine postmortem toxicology and challenges in decomposition.
6. Address ethical issues in forensic toxicology reporting.
7. Evaluate toxicokinetics and toxicodynamics of major drug classes.
8. Identify adulterants, preservatives, and environmental toxins.
9. Apply quality assurance protocols in forensic labs.
10. Study doping control and sports toxicology best practices.
11. Analyze workplace drug testing procedures and pitfalls.
12. Assess the impact of forensic toxicology in public health and law enforcement.
13. Gain hands-on experience through interactive case-based analysis.

Target Audiences

1. Forensic Scientists
2. Toxicologists and Chemists
3. Law Enforcement Officers
4. Medical Examiners
5. Pharmacologists
6. Criminal Investigators
7. Public Health Officials
8. Legal and Regulatory Professionals

Course Duration: 15 days

Course Modules

Module 1: Introduction to Forensic Toxicology

- Definition and scope
- Historical background
- Role in legal investigations
- Basic toxicological terms
- Introduction to forensic laboratories
- **Case Study: Toxicology in the Michael Jackson death investigation**

Module 2: Sample Collection, Preservation & Chain of Custody

- Sample types: blood, urine, hair, tissues
- Storage and handling protocols
- Chain of custody documentation
- Contamination risks
- Guidelines for medico-legal sampling
- **Case Study: Mishandled samples in a DUI case**

Module 3: Analytical Techniques in Forensic Toxicology

- GC-MS overview
- LC-MS/MS in toxicology
- Immunoassays and ELISA
- FTIR and UV-Vis spectroscopy
- Comparative performance analysis
- **Case Study: Detection of fentanyl using LC-MS/MS**

Module 4: Postmortem Toxicology

- Drug redistribution after death
- Decomposition challenges
- Biological matrix selection
- Interpretation pitfalls
- Time of death and drug correlation
- **Case Study: Determining drug overdose vs homicide**

Module 5: Novel Psychoactive Substances (NPS)

- Classification and emergence
- Challenges in identification
- Synthetic cannabinoids and cathinones
- Analytical detection methods
- Legal regulation updates
- **Case Study: Bath salts incident analysis**

Module 6: Toxicokinetics and Drug Metabolism

- Absorption, distribution, metabolism, excretion
- First-pass metabolism
- Role of enzymes (CYP450)
- Inter-individual variability
- Bioavailability and drug interactions
- **Case Study: Codeine metabolism misinterpretation**

Module 7: Workplace and Employment Drug Testing

- Testing policies and ethics
- Panel drugs overview
- Sample adulteration techniques
- Legal frameworks
- Result interpretation and reporting
- **Case Study: False positive amphetamine test in employment screening**

Module 8: Doping Control in Sports

- Common performance-enhancing drugs
- WADA regulations
- Testing methods and detection windows
- Athlete biological passport
- Sample collection protocols
- **Case Study: Lance Armstrong doping investigation**

Module 9: Environmental and Occupational Toxicology

- Pesticide and heavy metal poisoning

- Occupational exposure limits
- Risk assessment procedures
- Biomonitoring strategies
- Long-term toxic effects
- **Case Study: Lead exposure in industrial workers**

Module 10: Pediatric and Prenatal Toxicology

- Drug exposure in utero
- Breastfeeding and drug transfer
- Child abuse and toxicology testing
- Sample collection in neonates
- Interpretation of pediatric results
- **Case Study: Cocaine exposure in a newborn**

Module 11: Quality Assurance in Toxicology Laboratories

- ISO 17025 accreditation
- Internal and external audits
- Method validation
- Quality control charts
- Laboratory SOPs
- **Case Study: Accreditation failure impacting case trial**

Module 12: Toxicology Report Writing & Expert Testimony

- Components of a toxicology report
- Legal language and clarity
- Preparing for court testimony
- Cross-examination readiness
- Ethical reporting
- **Case Study: Court ruling overturned due to report ambiguity**

Module 13: Interpretation of Results in Complex Cases

- Poly-drug use cases
- Drug-drug interaction interpretation
- Therapeutic vs toxic vs lethal ranges
- Matrix interference issues
- Role of clinical correlation
- **Case Study: Benzodiazepine-alcohol interaction misjudgment**

Module 14: Emerging Trends in Forensic Toxicology

- AI and automation
- Digital toxicology databases
- Portable testing devices
- Micro-sampling technologies
- Predictive toxicology
- **Case Study: Mobile GC-MS in field investigation**

Module 15: Forensic Toxicology and Public Health

- Drug abuse surveillance
- Poison control data utilization
- Epidemiological toxicology

- Preventive toxicology strategies
- Policy recommendations
- **Case Study: Opioid epidemic and toxicology data in policymaking**

Training Methodology

- Lectures and multimedia presentations by forensic experts
- Hands-on lab demonstrations and virtual simulations
- Interactive case study analysis for real-world application
- Group activities and discussion forums to foster collaboration
- Online quizzes and assessments to reinforce learning
- Access to latest research articles and forensic databases

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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