Forensic Biotechnology and DNA Analysis Training Course

Professional Development Training Course Outline

Category	Biotechnology and Pharmaceutical Development	**Duration**	10 Days
Base Fee	$4,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Forensic Biotechnology and DNA Analysis plays a pivotal role in modern criminal investigations, medical research, and genetic studies. As advancements in biotechnology and DNA technology continue to evolve, forensic professionals must stay updated with the latest methods and tools. Forensic Biotechnology and DNA Analysis Training Course is designed to equip participants with the essential skills and knowledge to apply cutting-edge biotechnology techniques in forensic investigations. The course covers key concepts in forensic science, DNA extraction, analysis, profiling, and genetic mapping. By combining theory with hands-on practical sessions, learners will gain insights into the critical applications of DNA in criminal justice, paternity testing, and disaster victim identification.

This comprehensive program provides participants with an in-depth understanding of forensic biotechnology and DNA analysis. With a focus on trending methodologies, such as CRISPR technology, gene sequencing, and bioinformatics, the course prepares individuals for a career in forensic sciences. By engaging with real-world case studies, students will develop critical thinking and problem-solving skills to address complex forensic challenges. Furthermore, the course offers exposure to the latest tools and laboratory technologies, ensuring professionals are equipped to tackle real-world forensic challenges in the evolving landscape of biotechnology.

Programme Curriculum

Forensic Biotechnology and DNA Analysis Training Course

Introduction

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Course Duration

10 days

Course Objectives

1. Gain a foundational understanding of the key concepts and principles behind forensic biotechnology.
2. Learn state-of-the-art methods for extracting DNA from biological evidence.
3. Master techniques used in creating DNA profiles for criminal investigations.
4. Understand and apply Polymerase Chain Reaction (PCR) and Short Tandem Repeat (STR) analysis for DNA testing.
5. Explore the role of genetic fingerprinting in solving forensic cases.
6. Study DNA sequencing technologies and their use in forensic investigations.
7. Understand the importance of mitochondrial DNA in forensics, especially in cases involving degraded or old samples.
8. Learn methods for genetic mapping and how to preserve and handle forensic evidence properly.
9. Examine the use of DNA databases and ethical concerns surrounding DNA analysis.
10. Study techniques for handling and analyzing ancient or degraded DNA samples.
11. Apply learned techniques to real-world forensic case studies.
12. Learn about the latest technological advancements, including CRISPR and next-generation sequencing.
13. Understand the regulatory framework and legal aspects of DNA evidence in forensic investigations.

Target Audience

1. Forensic Scientists and DNA Analysts
2. Law Enforcement Personnel
3. Criminal Justice Professionals
4. Biotechnologists working in Forensic Laboratories
5. Medical Researchers in Genetic Forensics
6. Students pursuing careers in Forensic Science or Biotechnology
7. Legal Experts and Attorneys in Criminal Law
8. Healthcare Professionals in DNA Diagnostics

Course Modules

Module 1: Introduction to Forensic Biotechnology

- Overview of Forensic Biotechnology
- Importance of DNA in Forensic Science
- DNA Evidence Collection Techniques
- Key Forensic Biotechnology Technologies
- Case Studies on Ethical Considerations in DNA Forensics

Module 2: DNA Extraction and Preservation

- Methods of DNA Extraction
- Quality Control and Preservation of DNA Samples
- DNA Extraction from Different Biological Materials
- Case Studies on Optimizing DNA Yield for Forensic Analysis
- Troubleshooting DNA Extraction Challenges

Module 3: PCR and STR Analysis in Forensic Science

- Basics of Polymerase Chain Reaction (PCR)
- Short Tandem Repeat (STR) Analysis
- Role of PCR in DNA Profiling
- Forensic PCR Techniques and Applications
- Case Studies in PCR and STR Forensics

Module 4: Genetic Fingerprinting in Forensic Investigations

- Genetic Fingerprinting Techniques
- Applications in Paternity Testing and Criminal Cases
- Controlling Contamination in Genetic Fingerprinting
- Interpreting Genetic Fingerprint Results
- Real-World Case Studies

Module 5: Mitochondrial DNA Analysis

- Basics of Mitochondrial DNA
- Forensic Use of Mitochondrial DNA
- Challenges with Mitochondrial DNA Analysis
- Applications in Cold Cases
- Case Studies Involving Mitochondrial DNA

Module 6: DNA Sequencing Techniques

- Overview of DNA Sequencing Technologies
- Next-Generation Sequencing (NGS)
- Case Studies on Applications of Sequencing in Forensic Investigations
- Data Analysis and Interpretation in Sequencing
- Future Trends in DNA Sequencing for Forensics

Module 7: Bioinformatics in Forensic DNA Analysis

- Role of Bioinformatics in Forensic Biotechnology
- Analyzing DNA Sequences with Bioinformatics Tools

- Bioinformatics Software and Platforms for Forensic DNA
- Data Interpretation and Reporting
- Case Studies on Integrating Bioinformatics into Forensic Laboratories

Module 8: DNA Evidence Handling and Chain of Custody

- Importance of Proper Evidence Handling
- Chain of Custody Protocols
- Maintaining Integrity of Forensic DNA Evidence
- Legal Issues in DNA Evidence Handling
- Case Studies in Evidence Mismanagement

Module 9: Case Studies in Forensic DNA

- Real-World Case Studies
- Analyzing Forensic DNA in Crime Scene Investigations
- Applications of DNA Evidence in Solving Cold Cases
- DNA Evidence in Court Trials
- Case Study Analysis and Discussion

Module 10: Forensic Gene Mapping

- Gene Mapping in Forensics
- Use of Gene Mapping in Criminal Investigations
- Techniques for Mapping DNA Evidence
- Applications in Missing Persons Investigations
- Case Studies Involving Gene Mapping

Module 11: Forensic Biotechnology Regulatory Framework

- Legal Aspects of Forensic Biotechnology
- Regulatory Guidelines for DNA Testing
- Ensuring Compliance in Forensic Laboratories
- Data Privacy and Ethical Issues
- Case Studies of Legal Issues in DNA Evidence

Module 12: Advanced Forensic Technology Integration

- Integration of CRISPR Technology in Forensic Analysis
- Future Trends in Forensic DNA Technology
- Role of Artificial Intelligence in DNA Analysis
- Automation in Forensic Biotechnology Labs
- Case Studies in Advanced Technology Applications

Module 13: Handling Degraded and Ancient DNA

- Challenges of Analyzing Degraded DNA
- Techniques for Recovering and Amplifying Ancient DNA
- Case Studies on Forensic Applications in Archaeology and Anthropology
- Real-World Case Studies in Ancient DNA Analysis
- Ethical and Legal Issues in Ancient DNA Use

Module 14: DNA Databases in Forensic Science

- Building and Using DNA Databases
- Role of National DNA Databases in Criminal Investigations
- Ethical Concerns with DNA Databases
- Privacy Laws and DNA Databases
- Case Studies Involving DNA Database Matches

Module 15: Practical Applications and Future Trends in Forensic Biotechnology

- Practical Applications of Forensic Biotechnology in Law Enforcement
- Case Studies on Emerging Trends in Forensic DNA Technology
- Integration of Genomic Data in Forensic Investigations
- The Future of DNA Evidence in Courtrooms
- Preparing for the Future of Forensic Biotechnology

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

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
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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