

DNA Laboratory Processing Techniques

Tuition: \$500.00 | 90-Day Access | Preregister at: www.ForensicTraining.online



Course Description:

DNA Laboratory Processing Techniques provides a comprehensive look inside the forensic DNA laboratory and examines the scientific processes used to transform biological evidence into DNA data suitable for analysis and interpretation.

Designed to bridge the gap between evidence collection and DNA interpretation, this course follows evidence through the major stages of forensic DNA laboratory processing. Participants will explore **serology, biological screening, DNA extraction, quantitation, amplification, capillary electrophoresis, and sequencing**, gaining a practical understanding of the purpose of each step and how the quality of laboratory processing can influence the final DNA results.

Rather than simply focusing on the final DNA profile, participants will learn what happens to biological evidence once it enters the laboratory, why different processing techniques are used, and how decisions made throughout the analytical workflow can affect downstream analysis.

Who Should Take This Course?

DNA Laboratory Processing Techniques is designed for forensic scientists, DNA laboratory personnel, crime scene investigators, evidence technicians, law enforcement investigators, attorneys, forensic consultants, students, and other criminal justice professionals who want to better understand what happens to biological evidence inside the forensic DNA laboratory.

The course is particularly valuable for professionals who collect biological evidence, submit evidence for DNA examination, review forensic laboratory reports, evaluate DNA case files, prepare DNA-related cases for court, or need a better understanding of the scientific processes behind forensic DNA results.

Course Modules:

Serology

Explore the role of **forensic serology** in the identification and characterization of biological evidence.

Participants will examine common biological materials encountered in forensic casework, the principles behind presumptive and confirmatory testing, and how serological findings can help guide subsequent DNA testing decisions.

Screening

Learn how evidence is evaluated and screened before DNA analysis begins.

This module examines approaches used to locate potential biological material, prioritize samples, select areas for testing, and determine which items may provide the greatest evidentiary value. Participants will also explore contamination prevention and the importance of appropriate controls throughout the screening process.

Extraction

Examine the techniques used to **isolate and purify DNA from forensic evidence**.

Participants will explore the purpose of DNA extraction, challenges associated with different sample types, and considerations involving low-level, degraded, inhibited, or mixed biological samples. The module introduces commonly used extraction approaches and explains how extraction quality can affect subsequent testing.

Quantitation

Understand how forensic laboratories determine the **amount and quality of DNA** present within an extracted sample.

Participants will learn why DNA quantitation is an important step in the forensic workflow and how quantitation results can help identify potential concerns involving low DNA concentrations, degradation, inhibition, and sample quality while informing downstream testing decisions.

Amplification

Explore the principles of **Polymerase Chain Reaction (PCR)** and its critical role in modern forensic DNA testing.

Participants will learn how selected regions of DNA are amplified to generate sufficient genetic material for analysis and how factors such as DNA quantity, degradation, inhibition, contamination, and amplification conditions can influence results.

Capillary Electrophoresis

Learn how amplified DNA fragments are separated and detected using **capillary electrophoresis (CE)**.

This module introduces the principles behind DNA fragment separation, fluorescent detection, sizing, allele designation, and the generation of electropherograms used during traditional STR analysis.

Participants will develop a better understanding of how laboratory instrumentation converts amplified DNA into data that can ultimately be evaluated by a forensic DNA analyst.

Sequencing

Explore the growing role of **DNA sequencing technologies** in forensic science.

Participants will be introduced to sequencing principles and how sequence-based approaches can provide information beyond traditional fragment-length analysis. The module examines applications of sequencing to forensic DNA testing and introduces the expanding role of advanced sequencing technologies in areas such as SNP analysis, mitochondrial DNA, degraded samples, kinship analysis, and other specialized forensic applications.

What You Will Learn:

Upon completion of **DNA Laboratory Processing Techniques**, participants should be better prepared to:

- Describe the major stages of forensic DNA laboratory processing.
- Explain the role of forensic serology and biological evidence screening.
- Understand how laboratories identify and prioritize potential biological evidence for DNA testing.
- Explain the purpose of DNA extraction and recognize factors that can affect DNA recovery.
- Understand the role of DNA quantitation and how DNA quantity and quality can influence subsequent testing.
- Describe the basic principles of PCR amplification.
- Explain how capillary electrophoresis separates and detects amplified DNA fragments.
- Understand how laboratory processing produces the data used for DNA interpretation.
- Recognize how contamination, inhibition, degradation, and low DNA quantity can affect different stages of the laboratory workflow.
- Describe the basic principles and emerging forensic applications of DNA sequencing.
- Understand how decisions made during laboratory processing can ultimately influence the quality and usefulness of forensic DNA results.