

Contents

Unit 1-Introduction

- History of Forensics / 1
- Basic Services Provided by Crime Laboratories / 2
- The Functions of the Forensic Scientist / 3
- Provision of Expert Testimony / 3
- Standard Procedure for Approaching a Crime Scene / 4
- Collecting Evidence / 6

Unit 2-Physical Evidence

- Types of Analysis / 7
- Common Types of Physical Evidence / 7

Unit 3-Glass & Soil

- Glass Fractures / 13
- Stress Marks / 15
- Successive Penetrations / 15
- Forensic Characteristics of Soil / 17
- Fluorescence / 18
- Soil Comparisons / 19
- Density Gradient Tubes / 20

Unit 4-Fingerprints

- Fundamental Principles of Fingerprints / 21
- Ridge Characteristics / 22
- Anatomy of Fingerprints / 23
- Loops / 25
- Whorls / 26
- Arches / 26
- Automated Fingerprint Identification Systems (AFIS) / 27
- Crime-Scene Fingerprints / 27
- Dusting / 28
- Iodine Fuming / 28
- Ninhydrin Solution / 29
- Silver Nitrate / 29
- Other Ridge Patterns / 31
- Quick Reference Guide to Reading Prints / 34

Unit 5-Hair & Fiber

- Morphology of Hair / 37
- Cuticle Characteristics / 38
- Medullary Characteristics / 41
- Identification and Comparison of Hair / 43
- Frequently Asked Question about Hair / 44
- Fibers / 45
- Types of Fibers / 47

Unit 6-Firearms

- Handguns / 49
- Revolvers / 50
- Semiautomatic Pistols / 51
- Rifles / 52
- Shotguns / 52
- Other Firearms / 53
- Rifling / 55
- Caliber and Gauge / 55
- Firearm Terminology / 56
- Handgun Diagrams / 60

Unit 7-Ammunition & Ballistics Analysis

- Ammunition / 61
- Ammunition Design / 61
- Bullet Design / 63
- Bullet Compositions / 63
- Bullet Analysis & Comparison / 64
- Comparison Microscope / 67
- Cartridge Cases / 67
- Gunpowder / 69
- Effect on Targets / 70
- Primer Residues on the Hands / 73
- Serial Number Restoration / 74

Unit 8-Drugs & Paraphernalia

- Dependence and Abuse / 75
- Narcotic Drugs / 76
- Hallucinogens / 77
- Depressants / 79
- Stimulants / 81
- Drug-Control Laws / 82
- Drug Schedules / 83

Unit 9-Chemical Analysis

Drug Identification / 85
Theory of Chromatography / 85
Thin-Layer Chromatography (TLC) / 86
Color Test / 88
Microcrystalline Test / 89
Qualitative Analysis / 91
Instrumental Analysis / 92
Spectrophotometry / 92
Mass Spectrometry / 94
Spectrographic Analyzer / 95
Automation / 95

Unit 10-Bodies & Autopsies

Identifying Dead Bodies / 97
Reconstructing the Unidentified (Medial Imposition) / 98
The Coroner / 100
Determining Cause of Death / 100
In Home Deaths / 100
Crime Scene Deaths / 101
Vehicular Accidents / 101
What Warrants an Autopsy? / 102
Autopsies / 103
Dress / 103
External Examination / 104
Dissection of the Main Trunk / 105
The Organs / 106
Running the Gut / 106
Removing the Brain / 107
Closing Up / 108
Autopsy Report / 109

Unit 11-DNA & Typing

What Is DNA? / 117
Base Pairs / 118
VNTR / 119
Forensic DNA Testing / 119
RFLP (Restriction Fragment Length Polymorphism) / 120
PCR (Polymorphism Chain Reaction) / 121
STR (Short Tandem Repeat) or SSR (Simple Sequence Repeats) / 121
mtDNA (Mitochondrial DNA) / 122
DNA Testing-At a Glance / 123
CODIS / 123
Matching DNA Tests / 124
Reading DNA Tests / 124