

EXPLORING CREATION WITH FORENSICS

Table of Contents



INTRODUCTION	13
Materials needed	15
Module 1	17
<i>Joseph A. Prahlow, MD</i>	
INTRODUCTION TO FORENSIC SCIENCE	
The United States Government	18
Criminal Law	19
Civil Law	22
Witnesses, Testimony, and Admissibility.....	25
Evidence	27
Scientific Method & Inference	33
Lab 1: Introduction to Forensic Science.....	35
Consider a Forensics Profession.....	35
Module 2	37
<i>Joseph A. Prahlow, MD and Lacie Klosinski</i>	
FINGERPRINTS	
Introduction to Fingerprints.....	37
Recording and Collecting of Fingerprints.....	38
Classification of Fingerprints.....	39
Fingerprint Databases	41
Crime Scenes—Lifting Prints.....	44
Lab 2: Fingerprints.....	52
Consider a Forensics Profession.....	47
Module 3	49
<i>Charles A. Lynch and Joseph A. Prahlow, MD</i>	
TRACE EVIDENCE—HAIRS AND FIBERS	
Storytelling.....	49
Hairs and Fibers.....	50
Lab 3: Hairs & Fibers.....	52
A Few Things to Remember	61
Consider a Forensics Profession.....	61

Module 4..... 63

IMPRESSION & TOOLMARK EVIDENCE

Joseph A. Prahlow, MD

Foot and Footwear Impressions.....	64
Tire Impressions.....	67
Other Impression Evidence.....	69
Lab 4: Impression Evidence	71
Consider a Forensics Profession.....	71

Module 5 73

TOXICOLOGY & CHROMATOGRAPHY

Joseph A. Prahlow, MD and Prentiss Jones, PhD

What is Toxicology?	73
Settings for Testing	75
Test Performance	76
Interpretation of Toxicology Results.....	87
Lab 5: Toxicology & Chromatography	90
Consider a Forensics Profession.....	91

Module 6 93

FIREARMS EXAMINATION

Joseph A. Prahlow, MD and Ray Wolfenbarger

What Are Firearms?	93
Basic Gun Types.....	94
Basic Barrel Bore Types.....	95
Velocity Types.....	95
Calibers and Gauges.....	96
Loading and Firing Mechanisms.....	97
Common Gun Types.....	98
Ammunition Types.....	101
Firearms Examination	103
Class Characteristics.....	103
Individual Characteristics.....	104
Matching Casings to a Weapon.....	106
Test-Firing.....	107
Functionality and Safety Examination.....	108
Consider a Forensics Profession.....	109
Lab 6: Firearms Examination.....	109

Module 7 113

DEATH INVESTIGATION

Joseph A. Prahlow, MD

Introduction	113
Death	113
Death Investigation.....	114
Deaths Requiring Official Investigation	115
Death Scene.....	116
Follow-Up Information.....	119
Official Body Exam—External Exam vs Autopsy Exam ..	120
Death Certification.....	121
Lab 7: Death Investigation.....	122
Consider a Forensics Profession.....	123

Module 8.....131

FORENSIC PATHOLOGY

Joseph A. Prahlow, MD

Postmortem Examination of Dead Bodies.....	131
Identification of Decedents	132
Postmortem Changes.....	133
Decomposition.....	134
Time of Death.....	136
Forensic Autopsy.....	136
Purpose of the Forensic Autopsy.....	139
Classification of Cases	139
Summary.....	156
Lab 8: Forensic Pathology	156
Consider a Forensics Profession.....	156

Module 9..... 161

FORENSIC ANTHROPOLOGY

Walter L. Kemp, MD, PhD and Joseph A. Prahlow, MD

Forensic Anthropology	161
Bones	161
Human Versus Nonhuman.....	163
Historical or Forensic.....	164
Biological Profile	165
Taphonomy.....	170
Trauma.....	171
Forensic Archaeology	174
Lab 9: Forensic Anthropology	175
Consider a Forensics Profession.....	175

Module 10177

FORENSIC ODONTOLOGY

Joseph A. Prahlow, MD and Thomas Magnetti, DDS

Dental Anatomy	177
Anatomic Landmarks.....	178
Functions of Teeth	179
Types of Teeth	179
Dental Radiography.....	180
Dental Exam.....	181
Impressions of Teeth	182
Forensic Odontology.....	182
Lab 10: Forensic Odontology.....	184
Consider a Forensics Profession.....	185

Module 11 187

FORENSIC ENTOMOLOGY

Joseph A. Prahlow, MD and Neal Haskell, PhD

Basics of Entomology	187
Forensic Entomology.....	189
Additional Investigations	194
Research	196
Lab 11: Forensic Entomology	198
Consider a Forensics Profession.....	198

Module 12.....201

BLOODSTAIN EVIDENCE

Joseph A. Prahlow, MD and Alexander Arendt

Properties of Blood.....	202
Bloodstain Pattern Analysis (BPA).....	203
Reconstruction.....	211
Lab 12: Blood Stains.....	211
Consider a Forensics Profession.....	212

Module 13.....215

FORENSIC SEROLOGY & DNA TESTING

Joseph A. Prahlow, MD and W. Victor Weedn, MD, JD

Forensic Serology.....	215
Molecular Biology and DNA.....	217
Forensic DNA Testing—DNA Fingerprinting.....	223
Overview of Forensic DNA Typing.....	224
Forensic DNA Tests.....	225
NamUs National Missing Persons Database.....	233
Lab 13: DNA Testing.....	233
Consider a Forensics Profession.....	233

Module 14237

OTHER FORENSIC SCIENCES

Adam Prahlow and Joseph A. Prahlow, MD

Trace Evidence—Other Than Hair and Fibers.....	237
Forensic Geology.....	237
Glass Analysis.....	238
Arson Investigation.....	240
Paint Analysis.....	241
Gunshot Residue.....	242
Document Examination/Handwriting Analysis.....	242
Computer/Digital/Multimedia Forensics.....	243
Mobile Device Forensics.....	244
Forensic Audio/Video/Photo Analysis.....	244
Forensic Engineering.....	244
Accident Reconstruction.....	245
Forensic Psychiatry.....	246
Forensic Radiology.....	247
Forensic Artistry.....	247
Forensic Botany.....	248
Wildlife Forensic Science.....	249
Forensic Accounting.....	249
Lab 14: Handwriting Analysis.....	249
Consider a Forensics Profession.....	249

Module 15.....253

CRIME SCENE

Thomas Cameron and Joseph A. Prahlow, MD

A Crime Scene	253
Proper Crime Scene Management Steps.....	254
Crime Scene Investigation Equipment.....	258
Evidence Handling, Packaging, and Storage.....	261
Additional Evidence Handling, Packaging, and Storage Recommendations.....	262
Crime Scene/Evidence Photography	263
Crime Scene Sketches/Diagrams.....	265
Lab 15: Crime Scene Investigation	269
Consider a Forensics Profession.....	269

LABS.....273

For Teachers.....	275
-------------------	-----

INDEX.....**