Tennessee CTE

Criminal Justice III: Investigation

Scope and Development of Forensic Science 0

1 **Articulate important historical events and the associated contributors impacting the evolution of forensic science and crime scene investigation in the United States. Contributors should include, but are not limited to Locard, Orfila, Bertillon, Galton, Goddard, and Bass.** 1

2 **Describe the eleven sections of forensic science as defined by the American Academy of Forensic Science. Articulate the careers, roles and functions of each section.** 2

3 **Describe the evolution of the modern crime laboratory. Discuss the features of present-day crime labs, and explore how they have changed law enforcement and the conviction of criminals, their services and capabilities, and the new or emerging technologies they use.** 3

Career Planning 0

4 **Using the American Academy of Forensic Science and Young Forensic Scientist Forum, investigate occupations within forensic science. Demonstrate an understanding of each occupation by accurately articulating the following:** 4

- A Roles and responsibilities of the position 4A
- B Comparison of similar careers available in local, state, federal, and military systems 4B
- C Educational, training, and certification requirements 4C

Elements of Investigation 0

5 **Compare and contrast the roles and responsibilities of parole and probation officers with that of law enforcement officers in relation to search and seizure. Explain how evidence collected by the parole/probation officer might be used in court. Research cases such as Dulin v. State of Indiana and determine how the exclusionary rule was applied in each case.** 5

6 **Analyze and explain the steps in crime scene documentation.** 6

- A First responder responsibilities 6A
- B Preliminary survey 6B
- C Crime scene search methods including triangulation, rectangular coordinates, straight-line methods, and transecting baseline coordinates 6C
- D Identification and marking of evidence 6D

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E Narrative description 6E

F Administrative notes 6F

G Photography 6G

H Sketching/Diagramming 6H

I Evidence recovery log 6I

7 Review the legal and acceptable methods for collecting, packaging, and preserving physical evidence and the initiation and maintenance of the chain of custody. Using a mock crime scene: 7

A Document the crime scene using the steps identified in standard 10 7A

B Demonstrate proper methods of evidence collection and packaging 7B

C Initiate the chain of custody for each piece of evidence collected 7C

8 Identify emerging technologies and techniques being utilized by law enforcement while gathering and processing evidence at a crime scene and in the laboratory. Review a current or recent court case that utilized one of these technologies or techniques, and decide if the use of the technology/technique infringed on the defendant's rights. 8

Physical Evidence Analysis 0

9 Investigate the science surrounding the physical properties of matter, and explain how they are related to the role of the law enforcement officer when collecting evidence. Apply the principles of temperature, weight and mass, density, and refractive index in the context of forensic science. 9

10 Explain the physical composition of glass and relate the characteristics of various types such as tempered and laminated. Demonstrate the skill of identifying the classifications of glass fragments, and calculate the projectile path by examining glass fractures at a simulated scene. 10

11 Examine the forensic tools used in a field sobriety test and a blood alcohol test, and describe legal guidelines that must be followed when performing each of these tests as they relate to the constitutional rights of suspects. Evaluate concepts of toxicology and metabolism of alcohol, and determine the effects of alcohol on persons of different weights, ages, and genders. 11

12 Evaluate a death related to chemicals that can be harmful or poisonous to the human body, such as drugs or carbon monoxide. Describe the process for collecting and preserving toxicology evidence and the techniques used for detecting the type of substance. 12

13 Analyze the scientific basis of tests performed on various body fluids and/or stains at a crime scene to determine their origins. Demonstrate collection of simulated body fluids from a staged crime scene to preserve and prevent contamination of the sample. Include in the demonstration compliance with OSHA standards of practice when dealing with blood and body fluids. 13

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14 **Describe the techniques used to excavate bones from a crime scene and the methods for distinguishing human bones from animal bones. Identify the parameters for determining the age, sex, and possible ethnicity of a human skull.** 14

15 **Review an autopsy report to determine the time and cause of death through evaluation of body temperature, rigor mortis, post mortem lividity, appearance of eyes, skin color, and presence of arthropods. Document findings in an appropriate format.** 15

16 **Link the development of DNA testing and the Combined DNA Index System (CODIS) with changes in the criminal justice system, using professional journals, case studies, court cases, or interviews with law enforcement or forensic scientists.** 16

17 **Document the interpretation of a simulated bloodstain pattern, including the following information:** 17

- A Data gathered from pattern analysis concerning the violent event 17A
- B Impact of surface texture, directionality, and angle on pattern 17B
- C Calculation of angle of impact 17C
- D Methods to determine the area of convergence and area of origin for impact spatter patterns 17D
- E Whether the spatter is classified as a low-, medium-, or high-velocity impact spatter 17E
- F How the pattern was created and distinguishing features 17F
- G Type of spatter 17G

18 **Compare and contrast the physical and microscopic properties of human hair vs. animal hair. Demonstrate the skills of collecting and preserving hair evidence at a simulated crime scene.** 18

19 **Explain the automated fingerprint identification system (AFIS), why it was developed, and how it is currently being utilized in law enforcement. Demonstrate the procedure for detecting fingerprints, developing latent prints, and preserving developed prints.** 19

20 **Identify the recognizable characteristics, from bullets and cartridge casings, at a staged crime scene or from a case study. Explain, using a visual, how these characteristics are placed in the National Integrated Ballistics Information Network and the uses of the network by local, state, and federal law enforcement.** 20

21 **Research the concepts surrounding bullet trajectory and its uses in criminal investigations for determining victim and suspect locations and movements at a crime scene. Prepare a professional written report summarizing this information.** 21

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22 **Compare and contrast the various forensic techniques used at a crime scene and in the laboratory to determine gunpowder residue, shoe prints, tool marks, tire marks and bite marks. Provide a full explanation of each test.** 22