

Forensic Science and Crime Scene Investigation

Course Credit	1.0
Grade Level(s)	10-12
Prerequisite(s)	Biology, a physical science, Geometry with Data Analysis, Algebra I with Probability

Forensic Science and Crime Scene Investigation teaches students to apply chemistry, physics, and biology to a suspect, a criminal act or behavior, or a victim. This course prepares students in two distinct concentrations. The Forensic Science portion focuses on working in a crime lab setting as a forensic scientist or technician. Crime Scene Investigations covers the application of the scientific method at a crime scene, including scene processing and the identification and collection of evidence.

Foundational standards, shown in the table below, are an important part of every course. Through these standards, students learn and apply safety concepts, explore career opportunities and requirements, practice the skills needed to succeed in the workplace, develop leadership qualities and take advantage of the opportunities afforded by Career and Technical Student Organizations (CTSOs), learn and practice essential digital literacy skills, and work toward meeting and maintaining physical fitness standards for public safety. The foundational standards are to be incorporated throughout the course.

Foundational Standards	<ol style="list-style-type: none"> 1. Incorporate safety procedures in handling, operating, and maintaining equipment; utilizing materials and protective equipment; maintaining a safe work area; and handling hazardous materials and forces. 2. Demonstrate effective workplace and employability skills, including communication, awareness of diversity, positive work ethic, problem-solving, time management, and teamwork. 3. Explore the range of careers available in the field, investigate their educational requirements, and demonstrate job-seeking skills including resume-writing and interviewing. 4. Demonstrate digital literacy by using digital and electronic tools appropriately, safely, and ethically. 5. Participate in a Career and Technical Student Organization (CTSO) to increase knowledge and skills and to enhance leadership and teamwork. 6. Train for appropriate physical fitness and agility tests.
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	7. Demonstrate knowledge of defensive tactics and proper application of the use of force continuum in relevant situations.
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Forensic Science and Crime Scene Investigation Content Standards

Each content standard completes the stem “*Students will...*”

Introduction to Forensic Science	<ol style="list-style-type: none"> 1. Obtain, evaluate, and communicate information to describe the role of forensic science and evidence collection from historical cases in the criminal justice system. 2. Apprise the different types of forensic science laboratories and professional organizations. 3. Apply concepts of the scientific method to forensic science and to crime scene investigations.
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Physical Evidence	<ol style="list-style-type: none"> 4. Classify physical evidence based on how it is produced. 5. Plan and carry out an investigation to determine the value of physical and trace evidence. 6. Use models for the evaluation of handwriting and document evidence. 7. Construct explanations from collections of evidence, using various pathological and anthropological techniques. 8. Develop and use mathematical models to estimate height from bone length. 9. Distinguish between admissible and inadmissible scientific and technical evidence supplied by expert witnesses in criminal cases.
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Crime Scene Procedures, Techniques, and Analysis	<ol style="list-style-type: none"> 10. Explain the differences between processing and analyzing evidence. 11. Analyze and interpret data from different types of crime scene evidence to determine which forensic crime lab unit would have responsibility. <i>Example: soil, blood spatter, shoe print, hair, computer, glass, pills, fibers</i>
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	<p>12. Construct an explanation of how scientific forensic techniques used in collecting and submitting evidence for admissibility in court have evolved over time.</p> <p>13. Plan and carry out investigations using the scientific protocols for analyzing a crime scene. <i>Example: Set perimeter, search, isolate, collect evidence, photograph, sketch, and record.</i></p> <p>14. Construct an argument from evidence explaining the relevance of possible evidence at a site of an investigation.</p> <p>15. Develop models to analyze and communicate information obtained from the crime scene. <i>Example: Properly document and sketch a crime scene.</i></p>
Blood and Physiological Fluid Evidence	<p>16. Plan and carry out an investigation to use antigens and antibodies to determine blood type and to identify crime suspect(s) based on the results.</p> <p>17. Gather and share information about forensic identification of body fluids.</p> <p>18. Summarize important considerations in forensic investigation of sexual assault.</p> <p>19. Analyze and interpret DNA evidence to match a suspect to biological samples, identifying conditions and/or situations where errors commonly occur, and cite reasons for possible errors.</p> <p>20. Collect and preserve biological evidence for DNA analysis.</p> <p>21. Differentiate among blood-borne pathogens and describe their effects on the human body.</p>
Physical Pattern Evidence and Technological Examinations	<p>22. Analyze distinctive features of toolmark striations and impressions.</p> <p>23. Analyze distinctive features of tire, footwear, and other impression evidence.</p> <p>24. Plan and carry out an experiment using the process of chromatography to analyze and identify ink marks.</p>

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	<p>25. Perform physical and chemical analyses of evidence obtained from a crime scene, victim, and suspect, using spectrophotometers and other appropriate equipment to answer pertinent questions in the investigation. <i>Examples: examine broken glass to determine the direction, size, and velocity of the object which struck it; determine whether soil from a victim's shoe matches soil at the scene</i></p> <p>26. Develop fingerprints and classify characteristics for identification by using distinguishing features.</p> <p>27. Collect and analyze latent prints using proper forensic tools and techniques. <i>Examples: black powder, iodine, cyanoacrylate adhesive</i></p> <p>28. Retrieve fingerprints and classify characteristics for identification by using distinguishing features. <i>Examples: core, delta, bifurcation, bridge</i></p> <p>29. Analyze and compare examples of firearm evidence.</p> <p>30. Construct an explanation based on the path of a moving projectile to indicate how the trajectory of an object can determine the position of the person releasing the object.</p>
<p>Forensic Toxicology, Drugs, and Drug Analysis</p>	<p>31. Differentiate among the five distinct categories or schedules of drugs, including chemical composition and effects on the human body.</p> <p>32. Critique methods for laboratory analysis of controlled substance and design a solution to determine toxicity of a drug in a human based on body mass.</p> <p>33. Ask questions to develop a time-of-death estimation in an actual or simulated situation, using signs of rigor mortis and stages of decomposition.</p> <p>34. Compare the effects of various levels of alcohol in the human body.</p>

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Arson and Explosives Investigations	<p>35. Compare types of combustion reactions and give examples.</p> <p>36. Analyze burn patterns in the investigation of fire scenes.</p> <p>37. Gather, evaluate, and share information on methods for recovery and analysis of residues of ignitable liquids.</p> <p>38. Classify explosives and explosions based on their characteristics.</p>
Cybersecurity	<p>39. Assess cybersecurity tools, techniques, and technologies.</p> <p>40. Analyze basic computer evidence recovery techniques.</p> <p>41. Demonstrate strategies for starting and managing a network intrusion investigation.</p> <p>42. Assess methods of mobile device seizure and evidence recovery.</p>
Communication	<p>43. Create incident reports and forensic laboratory analysis reports.</p> <p>44. Cite evidence and provide oral testimony in actual or simulated situations.</p>