

Forensics Syllabus

Textbook: *Forensic Science: Fundamentals and Investigations; Bertino, Anthony J. 2008*

Course Description

Forensics is a semester (.5 credit) course designed to engage students using a creative, problem solving and inquiry based approach. This course will incorporate multidisciplinary instruction using topics from biology, chemistry, physics, and earth sciences. Included will be topics linked to social studies, in particular a glance into law and criminalistics, in addition to math. Students will apply their knowledge in these topics under laboratory supervision and throughout the process of solving forensics based cases.

Enduring Understanding for the Course

One of the most important tools for forensic investigation is observation and interpretation of evidence without placing prior judgment. Proper observation, analysis, collection, recording, and processing of evidence is what will set a suspect free or place them into custody. Scientific evidence when gathered, processed, and interpreted correctly, does not lie and holds true in a court of law.

General Course Outline

Unit	Objectives	Readings	Activities
1. Observation Skills	<ul style="list-style-type: none"> Describe and utilize varying observation techniques, including the significance of eyewitness testimony Describe what Forensic scientists do 	Chapter 1: pg. 2-12	1. Timed photographic/commercial image analysis with Q&A responses afterwards
2. Crime Scene Investigation and Evidence Collection	<ul style="list-style-type: none"> Describe the Principle of Exchange and significance of trace evidence Describe different types of evidence Secure, analyze, and process a crime scene Collect evidence properly Sketch a crime scene using proportionality 	Chapter 2: Pg. 20-32	<ol style="list-style-type: none"> Activity 2.1: Locard's Principle- Trace Evidence Crime-Scene Investigation
3. The Study of Hair	<ul style="list-style-type: none"> Describe the anatomy of hair and the role identification of hair can play at a crime scene 	Chapter 3: Pg. 48-61	<ol style="list-style-type: none"> Activity 3.1: Trace Evidence: Hair Activity 3.2: Hair measurement and match
4. The Study of Fibers and Textiles	<ul style="list-style-type: none"> Identify and describe common weave patterns of textile samples and compare through physical and chemical analysis 	Chapter 4: Pg. 76-89	<ol style="list-style-type: none"> Activity 4.1: Fibers, Activity 4.2: Thread count, Activity 4.3: Weave pattern, Activity 4.4: Textile identification, Activity 4.5: Burn analysis
5. Fingerprints	<ul style="list-style-type: none"> Describe the characteristics of a fingerprint Collect, process, and analyze fingerprint evidence 	Chapter 6: Pg. 132-145	<ol style="list-style-type: none"> Activity 6.1: Print Analysis Activity 6.3: Latent Fingerprint Analysis Activity 6.5: Is it a match?

6. DNA Fingerprinting	<ul style="list-style-type: none"> • Explain how crime scene evidence is collected for DNA analysis • Describe DNA and its role in identifying individuals based on evidence collected at a crime scene • Utilize gel electrophoresis to create a DNA fingerprint from a DNA sample collected at a crime scene 	Chapter 7: Pg. 158-172	<ol style="list-style-type: none"> 1. DNA extraction and spooling 2. What is PCR simulation 3. Paternity Test Investigation using gel electrophoresis
7. Blood and Blood Spatter	<ul style="list-style-type: none"> • Explain the composition of blood • Describe how to determine blood type and screen for the presence of human blood • Conduct a blood spatter analysis and use to recreate events at a crime scene 	Chapter 8: Pg. 194-210	<ol style="list-style-type: none"> 1. Activity 8.1: Presumptive Blood Tests 2. Activity 8.2: Blood Typing 3. Activity 8.3: Effect of Height on Blood Drops 4. Activity 8.4: Blood spatter impact angle 5. Activity 8.5: Area of Convergence 6. Activity 8.6: Point of Origin
8. Casts and Impressions	<ul style="list-style-type: none"> • Explain how various types of impressions can be used as trace evidence • Describe how to make foot, shoe, and tire impressions • Prepare dental impressions and match them with bite marks 	Chapter 15: Pg. 430-446	<ol style="list-style-type: none"> 1. Activity 15.1: Casting plaster impressions 2. Activity 15.5: Dental Impressions
9. Ballistics	<ul style="list-style-type: none"> • Discuss differences between a handgun, rifle, and a shotgun • Discuss how rifling can affect the flight of a projectile • Determine the position of the shooter based on bullet trajectory 	Chapter 17: Pg. 490-504	<ol style="list-style-type: none"> 1. Activity 17.1: Bullet Trajectory
10. Death: Meaning, Manner, Mechanism, Cause, and Time	<ul style="list-style-type: none"> • Distinguish between four manners of death: natural, accidental, suicidal, and homicidal • Distinguish between cause, manner, and mechanism • Use evidence of rigor, algor, and livor mortis to calculate approximate time of death • Describe stages of decomposition of a corpse • Use insect evidence to estimate time of death • Describe how various environmental factors may influence the estimated time of death 	Chapter 11: Pg.308-323	<ol style="list-style-type: none"> 1. Activity 11.1: Calculating time of death using rigor mortis 2. Activity 11.2: Calculating time of death using algor mortis

The **final assessment** will incorporate analysis of a crime scene scenario where students will observe, sketch, photograph, process and analyze evidence to draw a conclusion of who the perpetrator may be.