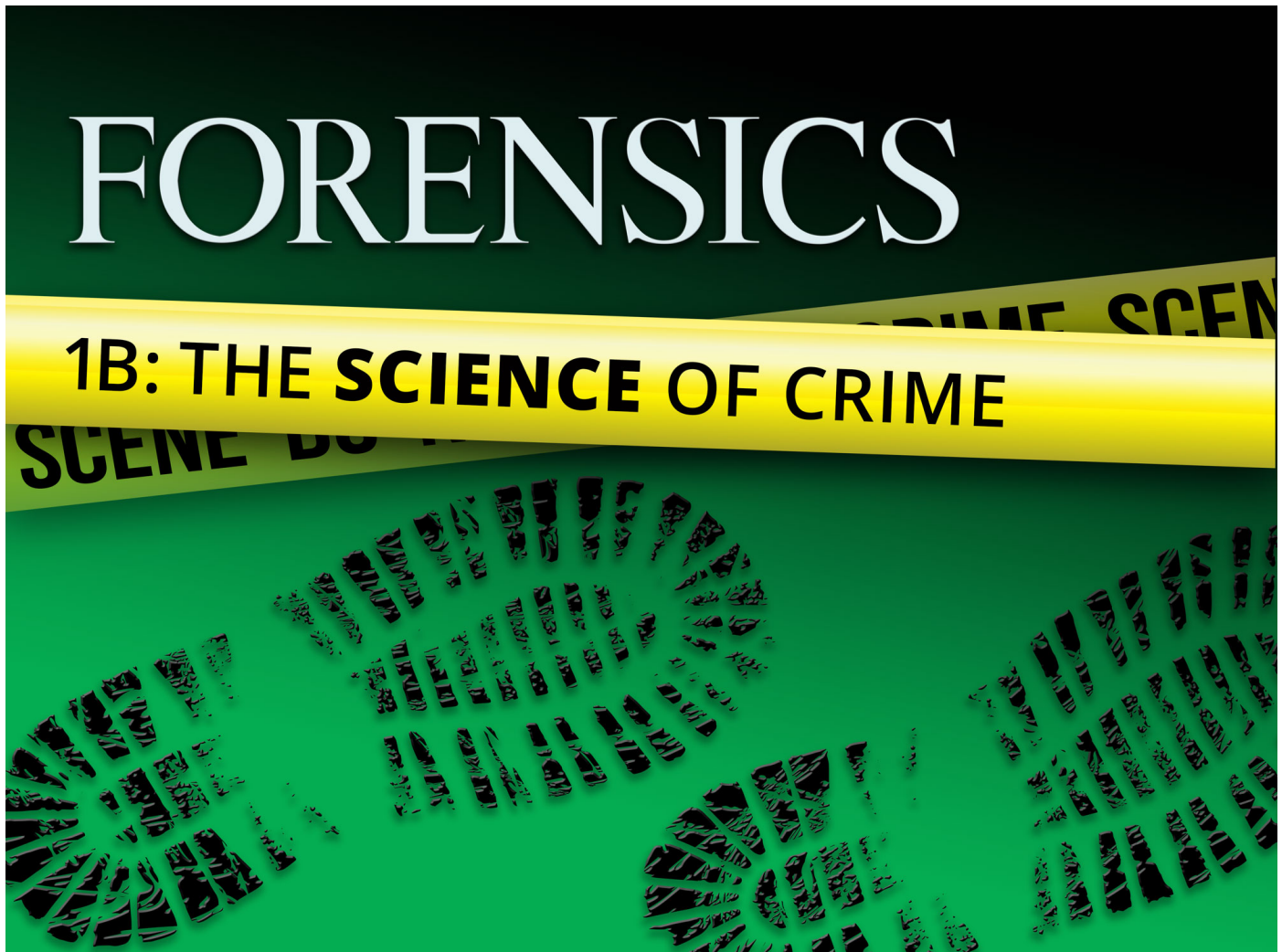


## Course Syllabus

What you will learn in this course



### Forensics 1b: The Science of Crime

You've investigated the surface and have started building a case, but now it's time to examine the field of forensics further. In this course, you will delve into the details, studying DNA analysis, forensic anthropology, tool marks, arson, impressions, toxicology, questioned documents, and digital forensics. You will also explore the different specialties within a forensics team. You'll learn more about what each field entails, what that specialist does at the scene and in the lab, and what conclusions can be made based on their analysis. Let's continue strengthening your case and interests for this fascinating field.

#### Unit 1: Analyzing DNA

Watch any detective show on television and you will see someone sending a DNA sample to the lab for testing. But what exactly is DNA? How do forensic scientists actually retrieve it off a surface like a glass

at the crime scene? And then how does that sample lead to clear results that can be presented in front of a jury? Identifying DNA is not a simple process, and forensic scientists need to understand exactly how DNA is designed and functions so that they can work correctly with DNA and read the results of analytical processes. With all the science involved and helpful technology, forensic scientists need to make sure that they know the basics of how DNA is structured, collected, analyzed, and stored.

## What will you learn in this unit?

After studying this unit, you will be able to:

1. Describe the structure and function of DNA
2. Explain the analytical procedures for forensic DNA typing
3. Locate resources to analyze DNA results, including a national database
4. Collect and preserve DNA samples

<b>Unit 1 Assignments</b>	
<b>Assignment</b>	<b>Type</b>
Lesson 01: Understanding and Extracting DNA	Lesson
Lesson 02: DNA Typing and Technology	Lesson
Lesson 03: DNA Analysis	Lesson
Lesson 04: Collecting and Using DNA Samples	Lesson
Critical Thinking Questions	Submission
Activity: What Do I Want to Learn?	Submission
Cumulative Project 1: What DNA Secrets are in a Strawberry?	Submission
Unit 1 Discussion 1	Discussion
Unit 1 Discussion 2	Discussion
Unit 1 Quiz	Multiple Choice

## Unit 2: Developing a Narrative of Death

In a homicide case, investigators will need to know how, when, and where a person died. Fortunately, there is a lot that the body itself can tell forensic scientists to make this information clear.

Understanding the processes that a body goes through after death is just one of the ways that forensic scientists use to figure out when a person died. But this is just part of the basic anatomy that forensic scientists need to know to properly analyze and document the scene where the body is found.

## What will you learn in this unit?

After studying this unit, you will be able to:

1. Differentiate between cause of death, mechanism of death, and manner of death
2. Articulate phases of mortis and decomposition
3. Explain the role of entomology in determining time of death
4. Recognize basic bone structures and the makeup of bones
5. Explain identifying features of human remains

<b>Unit 2 Assignments</b>	
<b>Assignment</b>	<b>Type</b>
Lesson 01: What Actually Kills People	Lesson
Lesson 02: Stages of Mortis	Lesson
Lesson 03: Details of Decomposition	Lesson
Lesson 04: Forensic Anthropology	Lesson
Lesson 05: The Story Bones Tell	Lesson
Critical Thinking Questions	Submission
Cumulative Project 2: Can I Identify the Major Bones of the Human Body?	Submission
Cumulative Project 3: What is a Forensic Anthropologist's Job Like?	Submission
Activity: What is a Forensic Entomologist's Job Like?	Submission
Unit 2 Discussion 1	Discussion
Unit 2 Discussion 2	Discussion
Unit 2 Quiz	Multiple Choice

## Unit 3: Firearms and Tool Marks

It is very hard to fire a gun without leaving a trace, and this means that firearms are an important source of forensic evidence. From the bullets that they leave behind to the residue that appears on the scene, firearms give investigators a lot to work with. Forensic scientists need a basic understanding of how guns work and the different types of firearms so that they know what to look for at the scene and the places to find the distinctive markings that will connect a bullet to the gun that fired it.

## What will you learn in this unit?

After studying this unit, you will be able to:

1. Evaluate the different projectiles used in firearms

2. Differentiate among types of firearms
3. Describe identifying marks on bullets and casings
4. Explain proper techniques for collecting and analyzing ballistic evidence
5. Explore how ballistic evidence and tool marks are analyzed

<b>Unit 3 Assignments</b>	
<b>Assignment</b>	<b>Type</b>
Lesson 01: All About Ballistics	Lesson
Lesson 02: Types of Firearms	Lesson
Lesson 03: Assessing Ammunition	Lesson
Lesson 04: Collecting Ballistic Evidence	Lesson
Lesson 05: Analyzing Ballistic Evidence	Lesson
Critical Thinking Questions	Submission
Cumulative Project 4: What are the Mechanisms Behind Ballistics?	Submission
Activity: What Cold Case was Solved with Modern Forensics?	Submission
Unit 3 Discussion 1	Discussion
Unit 3 Discussion 2	Discussion
Unit 3 Quiz	Multiple Choice

## Unit 4: Explosives and Arson

How do you solve a crime when all of your evidence has caught on fire? Understanding the dynamics of fire and the kinds of evidence that explosives leave is key for arson investigators, a specialized type of forensic scientist. Discover the types of trace evidence left at these scenes, the technology involved in analyzing this evidence, and how this evidence can later be used in cases.

### What will you learn in this unit?

After studying this unit, you will be able to:

1. Articulate the properties and elements of fire
2. Differentiate among types of explosives
3. Identify elements arson investigators look for at a crime scene
4. Describe standard practices in arson evidence collection
5. Discuss the types of forensic testing used for evidence from arson and explosion crime scenes

<b>Unit 4 Assignments</b>	
<b>Assignment</b>	<b>Type</b>
Lesson 01: Facts About Fire	Lesson
Lesson 02: Examining Explosions	Lesson
Lesson 03: Investigating Arson	Lesson
Lesson 04: Collecting and Documenting Evidence	Lesson
Lesson 05: Arson Evidence Analysis	Lesson
Critical Thinking Questions	Submission
Activity 1: What Have I Learned So Far?	Submission
Activity 2: What Is a Fire?	Submission
Cumulative Project 5: How Does a Roasting Marshmallow Explain Heat Transfer?	Submission
Unit 4 Discussion 1	Discussion
Unit 4 Discussion 2	Discussion
Unit 4 Quiz	Multiple Choice

## Midterm Exam

1. Review information acquired and mastered from this course up to this point.
2. Take a course exam based on material from the **first half** of the course (**Note:** You will be able to open this exam only one time.)

<b>Midterm Exam Assignments</b>	
<b>Assignment</b>	<b>Type</b>
Midterm Exam	Multiple Choice
Midterm Discussion	Discussion

## Unit 5: Impressions and Patterns

If something valuable is locked up, a criminal is going to have to pry something open to get at it. When they do, they leave telling evidence behind for analysis. Tool marks are just one type of impression evidence. The tire tracks left behind when the criminal speeds away or a footprint in the mud are also important clues that help investigators build a case. Collecting and analyzing this kind of evidence is all in a day's work for forensic scientists.

## What will you learn in this unit?

After studying this unit, you will be able to:

1. Identify different types of impression evidence
2. Demonstrate appropriate techniques for identifying and collecting impression evidence
3. Differentiate among casting techniques for different types of impressions
4. Discuss various databases that aid law enforcement in impression evidence analysis
5. Evaluate the significance of tool mark evidence and common tools used in crimes

<b>Unit 5 Assignments</b>	
<b>Assignment</b>	<b>Type</b>
Lesson 01: How Impressions Are Created	Lesson
Lesson 02: How to Gather 2D Impression Evidence	Lesson
Lesson 03: How to Gather 3D Impression Evidence	Lesson
Lesson 04: Comparing Tread Evidence	Lesson
Lesson 05: Evaluating Tool Marks	Lesson
Critical Thinking Questions	Submission
Cumulative Project 6: How Can I Collect and Compare Impressions?	Submission
Activity: How Can I Identify Common Tread Patterns?	Submission
Unit 5 Discussion 1	Discussion
Unit 5 Discussion 2	Discussion
Unit 5 Quiz	Multiple Choice

## Unit 6: Is It Poison?

Is it murder or an accident? The signs of poisoning can be subtle, so forensic scientists need to be alert to the possibility. Even if a crime is not as extreme as murder, often drugs will be involved. In other cases, toxic elements in the environment can poison people. This means that forensic scientists need to know what to look for and how to prove which substances are present so that they properly assess the crime scene.

## What will you learn in this unit?

After studying this unit, you will be able to:

1. Identify the types of environmental poisons
2. Differentiate among the effects of common illegal drugs

3. Describe the types of poison exposure and the way poisons travel through the body
4. Explain quantitative and qualitative testing options for toxic substances

<b>Unit 6 Assignments</b>	
<b>Assignment</b>	<b>Type</b>
Lesson 01: What Is Toxicology?	Lesson
Lesson 02: Drugs	Lesson
Lesson 03: Exposure and Effects of Poison	Lesson
Lesson 04: Testing for Drugs	Lesson
Critical Thinking Questions	Submission
Activity: What Can Modern Medicine Uncover About the History of Toxicology?	Submission
Cumulative Project 7: What Poisons are in My Home?	Submission
Unit 6 Discussion 1	Discussion
Unit 6 Discussion 2	Discussion
Unit 6 Quiz	Multiple Choice

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## Unit 7: Document Analysis

A common reference in professional spaces is to “follow the paper trail” when talking about trying to sort out who did or said what while on the job. But what happens when the paper is the trail? That is where document analysis comes in. Thanks to training and technology, forensic scientists can scrutinize paper trails as they do footprints and follow that paper trail to its source.

### What will you learn in this unit?

After studying this unit, you will be able to:

1. Discuss the most commonly forged documents and the types of alterations made to them
2. Summarize the role of forensic document examiners when they are given a questioned document
3. Describe unique features of handwriting and how it is analyzed
4. Explain the types of tests that can be done to analyze an ink sample
5. Identify anti-counterfeit measures in US currency

Unit 7 Assignments	
Assignment	Type
Lesson 01: How Are Documents Forged?	Lesson
Lesson 02: Forensic Document Experts	Lesson
Lesson 03: Your Writing Has Fingerprints	Lesson
Lesson 04: What About the Ink?	Lesson
Lesson 05: Forging Money	Lesson
Critical Thinking Questions	Submission
Activity: What Do Historical Forgery Cases Teach Us About Document Analysis?	Submission
Cumulative Project 8: How Can I Analyze Handwriting?	Submission
Unit 7 Discussion 1	Discussion
Unit 7 Discussion 2	Discussion
Unit 7 Quiz	Multiple Choice

## Unit 8: Digital Forensics

If you are a fan of working with technology, forensic computing might be the career for you! Computers, tablets, cell phones, and other devices all leave digital information trails that are particularly useful when investigating crimes. So much of our daily lives is documented on technology that skilled experts can retrieve a lot of information about where we have been or what we have been looking up online. In addition, new equipment and techniques are constantly expanding the field and they will require skilled professionals to use them, so there are a lot of forensic careers for those with technical skills.

### What will you learn in this unit?

After studying this unit, you will be able to:

1. Describe the components of a computer and explain which components are of greatest interest to a digital forensic specialist
2. Contrast the types of data stored in a computer
3. Identify the types of data users create when browsing the internet
4. Discuss what phone data offers the most detail about its user
5. Summarize how biometric data is used in law enforcement
6. Reflect on which fields of forensic science interest you and identify what educational experience and soft skills you would need to join those fields



Unit 8 Assignments	
Assignment	Type
Lesson 01: This Computer is Under Investigation	Lesson
Lesson 02: Data and Storage Space Analysis	Lesson
Lesson 03: Internet Data and Communication	Lesson
Lesson 04: Cell Phones and Mobile Devices	Lesson
Lesson 05: Biometric Data	Lesson
Lesson 06: Building a Career in Forensic Science	Lesson
Critical Thinking Questions	Submission
Activity 1: How Much Privacy Should a Person Have?	Submission
Activity 2: What Did I Get from This Course?	Submission
Final Cumulative Project: What Are My Top Moments in Forensic Science?	Submission
Unit 8 Discussion 1	Discussion
Unit 8 Discussion 2	Discussion
Unit 8 Quiz	Multiple Choice

## Final Exam

1. Review information acquired and mastered from this course up to this point.
2. Take a course exam based on material from the **second half** of the course (**Note:** You will be able to open this exam only one time.)

Final Exam Assignments	
Assignment	Type
Final Exam	Multiple Choice
Final Discussion	Discussion