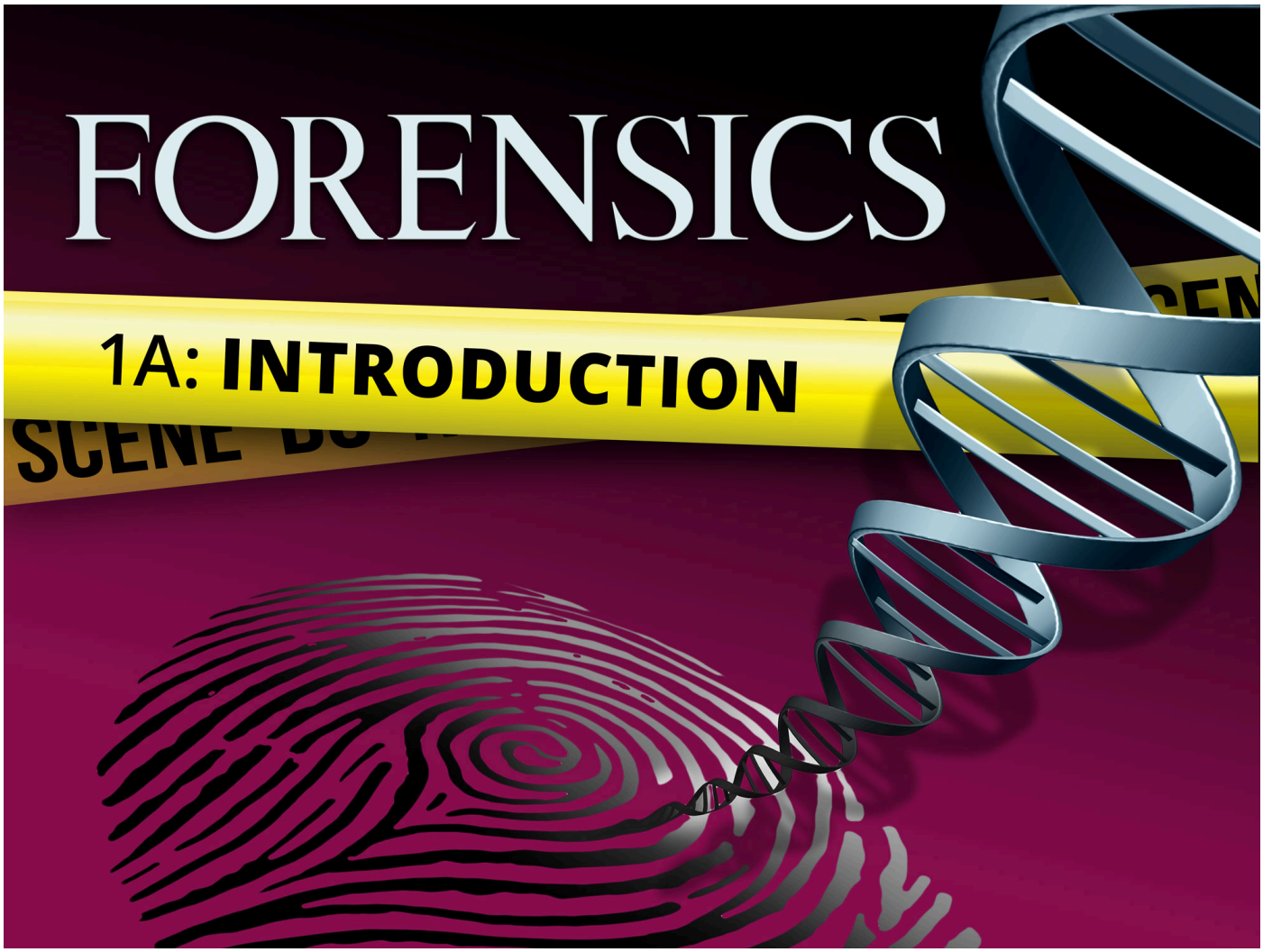
Course Syllabus

What you will learn in this course



Forensics 1a: Introduction

Our notions of forensics are often fictionalized, containing fantastic notions of what forensic science really is. In this course, you'll explore the truth behind the science from its history to its modern-day developments. You will learn how detectives conduct thorough investigations as well as common equipment and methods that are used throughout the field. Finally, you will learn about collecting and analyzing the most common types of evidence found at a crime scene and how they guide investigators to answers. Let's track your interests and continue your pursuit of justice through science!

Unit 1: Investigating Crime: What's It All About?

When you watch crime television shows or movies, there is usually one or two main investigators who handle all of the evidence from start to finish. They seem to have an endless amount of expertise and give results from multiple areas of study. But that's not how forensics works in the real world. It takes years to become an expert in a particular area of study and teams of scientists to collect, analyze, and present the evidence. So how did we get here, and what are the expectations and roles of forensics investigators? Let's find out.

What will you learn in this unit?

After studying this unit, you will be able to:

1. Describe how forensic science grew and changed over time
2. Summarize important recent developments in forensic science
3. Understand the professional expectations of forensic scientists
4. Explain the consequences of unethical behavior
5. Distinguish between criminalistics and criminology
6. Identify the roles of crime scene investigators

Unit 1 Assignments	
Assignment	**Type**
Lesson 01: History of Forensic Science	Lesson
Lesson 02: Modern Forensic Developments	Lesson
Lesson 03: Expectations of Forensic Science Professionals	Lesson
Lesson 04: Practicing Ethics	Lesson
Lesson 05: Disciplines in Forensic Science	Lesson
Lesson 06: Roles and Responsibilities	Lesson
Critical Thinking Questions	Submission
Activity 1: What Do I Want to Learn?	Submission
Activity 2: What Historical Contributions Shaped Modern Forensics?	Submission
Activity 3: Who Works in the Forensics Lab?	Submission
Unit 1 Discussion 1	Discussion
Unit 1 Discussion 2	Discussion
Unit 1 Quiz	Multiple Choice

Unit 2: Think Like a Scientist

Where would forensic science be without science? It gives the practice of forensics a specific way of drawing conclusions that we can depend on. It also pushes scientists to be consistent, to challenge assumptions, and to incorporate the work of other scientists. Fortunately, science has also led to many kinds of high-tech equipment that helps scientists reach the kind of definitive conclusions that criminal justice requires. Science shows us the way and gives us the tools to get the job done.

What will you learn in this unit?

After studying this unit, you will be able to:

1. Explain the importance of the scientific method to forensic science
2. Make keen observations at a crime scene
3. Ask a variety of questions and make strong hypotheses
4. Describe how various equipment is used to test hypotheses

5. Suggest the best way forward in a case based on the results of tests

Unit 2 Assignments	
Assignment	**Type**
Lesson 01: Science and the Scientific Method	Lesson
Lesson 02: Observation	Lesson
Lesson 03: From Research to Hypothesis	Lesson
Lesson 04: Equipment and Technology	Lesson
Lesson 05: Analyzing and Sharing Results	Lesson
Critical Thinking Questions	Submission
Cumulative Project 1: How Do I Turn Questions into Hypotheses?	Submission
Cumulative Project 2: How Do I Test My Hypothesis?	Submission
Unit 2 Discussion 1	Discussion
Unit 2 Discussion 2	Discussion
Unit 2 Quiz	Multiple Choice

Unit 3: Act Like a Scientist

Forensic science is all about data, but let's get more specific. There are different kinds of data and many ways and places to collect it. Forensic scientists also use a variety of tools and methods to analyze and communicate data and interpretations of data. Even the way that forensic scientists think will shape these reports, so it's key to use a range of critical thinking skills. Standardization helps with all stages of the process, from documenting the scene to writing reports that can stand up in court decades later. There can be a lot to keep track of, so let's see how to organize the chaos.

What will you learn in this unit?

After studying this unit, you will be able to:

1. Demonstrate safe practices during laboratory and field investigations
2. Employ a range of tools and methods in the collection and analysis of data
3. Create documents that clearly show data and interpretations of data
4. Examine data in a neutral manner that minimizes common biases

Unit 3 Assignments	
Assignment	**Type**
Lesson 01: Safety First	Lesson
Lesson 02: Collecting and Analyzing Data	Lesson
Lesson 03: Communicating Findings	Lesson
Lesson 04: Critical Thinking	Lesson
Critical Thinking Questions	Submission
Activity 1: What's In the News?	Submission
Cumulative Project 3: What Laboratory Materials are Used in Forensic Science?	Submission
Activity 2: How Do I Prepare for Laboratory Work?	Submission
Cumulative Project 4: How Do I Collect Data?	Submission
Unit 3 Discussion 1	Discussion
Unit 3 Discussion 2	Discussion
Unit 3 Quiz	Multiple Choice

Unit 4: At the Crime Scene

When a crime occurs and the police are called, a crime scene investigator will arrive to document the scene and collect evidence. There are strict rules and clear expectations when it comes to the collection and preservation of evidence. Their importance cannot be overstated. Any wrong step along the way can spoil an investigation. They keep the work within the bounds of the Constitution. They make sure the current team as well as future investigators can do their work. In short, they ensure justice and fairness for all involved.

What will you learn in this unit?

After studying this unit, you will be able to:

1. Conduct legal searches
2. Search a crime scene
3. Document a crime scene
4. Secure evidence
5. Communicate with a team of forensic scientists

Unit 4 Assignments	
Assignment	**Type**
Lesson 01: Rules of Evidence	Lesson
Lesson 02: Searching the Scene	Lesson
Lesson 03: Crime Scene Sketches	Lesson
Lesson 04: Evidence Collection	Lesson
Lesson 05: Teamwork in Forensic Science	Lesson
Critical Thinking Questions	Submission
Activity: What Have I Learned So Far?	Submission
Cumulative Project 5: How Can I Secure Evidence?	Submission
Cumulative Project 6: How Do I Analyze Evidence in the Lab?	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.)

Midterm Exam Assignments	
Assignment	**Type**
Midterm Exam	Multiple Choice
Midterm Discussion	Discussion

Unit 5: Back at the Lab

Much of a forensic scientist's job takes place in a lab, but what exactly do they do there? In short, they gather clues in an effort to uncover the truth around a case. Indeed, given the right equipment and an eye for detail, forensic scientists can build cases from tiny elements invisible to the human eye. It is amazing how much information they can gather from samples of trace evidence. Whether it is reading glass to tell where a bullet came from or confirming that paint traces on a suspect's clothing match those found at the crime scene, forensic scientists bring technology to bear to make a big deal out of little details.

What will you learn in this unit?

After studying this unit, you will be able to:

1. Differentiate among types of glass and recognize the qualities of these types
2. Identify the elements of paint and how to collect samples at a crime scene
3. Distinguish types of fiber and recognize their role in crime scene investigations
4. Recognize the structure of hair and discrete elements that help identify the source of the hair

5. Determine the appropriate microscope for a variety of types of trace evidence

Unit 5 Assignments	
Assignment	**Type**
Lesson 01: Getting to Know Glass	Lesson
Lesson 02: Properties of Paint	Lesson
Lesson 03: Figuring Out Fibers	Lesson
Lesson 04: Hints from Hair	Lesson
Lesson 05: A Closer Look at Trace Evidence	Lesson
Critical Thinking Questions	Submission
Cumulative Project 7: What Key Features Should I Look for Using Microscopy?	Submission
Cumulative Project 8: What Trace Evidence Do I Encounter in a Day?	Submission
Cumulative Project 9: How Can I Macroscopically Examine Trace Evidence?	Submission
Unit 5 Discussion 1	Discussion
Unit 5 Discussion 2	Discussion
Unit 5 Quiz	Multiple Choice

Unit 6: Fingerprint Identification

We've all seen it on television and in movies. The suspect brushes their finger across a table, leaving a single fingerprint. Investigators spot it immediately, submit it to a database, and are knocking down the suspect's door after the first ad break. Real life is a bit more complicated than that, but the steps aren't far off. Indeed, collecting and analyzing fingerprints is an essential part of forensic science. It's led investigators to countless suspects. To do it well, they need to first locate fingerprints. Then, depending on the surface, they'll use a method of their choosing to capture them. Back in the lab, they'll determine exactly what kind of print they have and whether a match can be found in the national database. It's a bit slower than TV, but fingerprints really do lead investigators to suspects' doors.

What will you learn in this unit?

After studying this unit, you will be able to:

1. Distinguish and categorize different types of fingerprints
2. Collect and process fingerprints and other imprints from a crime scene
3. Analyze and compare fingerprints and other imprints in a lab
4. Describe the history and role of databases in making biometric data available to law enforcement

Unit 6 Assignments	
Assignment	**Type**
Lesson 01: Fingerprint Basics	Lesson
Lesson 02: Collecting Fingerprints and Other Imprints	Lesson
Lesson 03: Processing Fingerprints	Lesson
Lesson 04: Identifying Fingerprints with Technology	Lesson
Critical Thinking Questions	Submission
Cumulative Project 10: How Can I Collect and Analyze Fingerprints?	Submission
Activity: How Can I Lift Latent Fingerprints?	Submission
Unit 6 Discussion 1	Discussion
Unit 6 Discussion 2	Discussion
Unit 6 Quiz	Multiple Choice

Unit 7: Working with Biological Fluids

Forensic scientists need to know how to handle blood at the scene. Blood shows up in a variety of locations and quantities, and these differences impact how blood is collected and stored for analysis. But knowing blood science well is only a start; there are other biological fluids to collect from a scene as well. Because this is a profession based on solid evidence, the identification, collection, and storage of bodily fluid evidence requires care and attention to make sure all evidence makes it back to the lab in the best shape for testing.

What will you learn in this unit?

After studying this unit, you will be able to:

1. Describe the major characteristics of human blood
2. Explain how alcohol is processed in the body and impacts normal functioning
3. Identify and collect blood and other bodily fluids from a crime scene
4. Move blood and other bodily fluids to a lab in order to carry out more detailed tests and ensure proper storage

Unit 7 Assignments	
Assignment	**Type**
Lesson 01: The Basics of Blood	Lesson
Lesson 02: Blood Alcohol Content	Lesson
Lesson 03: At the Crime Scene	Lesson
Lesson 04: Lab Analysis of Biological Fluids	Lesson
Critical Thinking Questions	Submission
Activity 1: How is Blood Type Determined?	Submission
Activity 2: How Can I Use Punnett Squares?	Submission
Cumulative Project 11: How Can I Test Bodily Fluid Tests?	Submission
Unit 7 Discussion 1	Discussion
Unit 7 Discussion 2	Discussion
Unit 7 Quiz	Multiple Choice

Unit 8: Analyzing Blood

What looks like a messy crime scene to the untrained eye is actually a wealth of information to the forensic scientist. The patterns left behind through the physics of the event leave a story that can be retold to discover all kinds of details about what actually happened. The trained eye can discern everything, from the kind of weapon and the intensity of the strike, to the movements of the victim and assailant. In this case, we're going to look specifically at the blood patterns left behind for the forensic scientist to interpret.

What will you learn in this unit?

After studying this unit, you will be able to:

1. Describe what the characteristics of blood at a crime scene can reveal about crimes
2. Use patterns of blood and blood drops to reveal likely past actions
3. Document blood at the crime scene
4. Collaborate effectively

UNIT 8 Assignments	
Assignment	**Type**
Lesson 01: Blood Spatter Characteristics	Lesson
Lesson 02: Common Blood Spatter Patterns	Lesson
Lesson 03: Documentation and Evaluation	Lesson
Lesson 04: The Human Factor	Lesson
Critical Thinking Questions	Submission
Cumulative Project 12: How Can I Scientifically Illustrate Blood Drops?	Submission
Cumulative Project 13: How Can I Simulate Blood Spatter?	Submission
Activity: What Have I Learned?	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