



FORNESIC SCIENCE SYLLABUS

COURSE OVERVIEW

Forensic Science is the application of scientific principles and techniques to matters of criminal and civil law. It involves the systematic collection, preservation, analysis, and interpretation of physical evidence from crime scenes to help establish facts that can be presented in a court of law. Forensic scientists use various disciplines such as biology, chemistry, physics, and medicine to analyze evidence and provide objective findings that aid in the investigation and resolution of legal cases.



In the first half of this hands-on course students will be introduced to the world of forensic science. Students will learn how scientific principles and techniques are used by forensic scientists to solve crimes. Students will explore the importance of keen observation skills and how they play a vital role in forensic science. Students will learn the steps involved in processing a crime scene, including the collection, preservation, and documentation of evidence. The course will cover the analysis of hair, fibers, textiles, pollen, spores, soil, and glass, allowing students to understand the diversity and intricacies of forensic evidence. In addition, students will delve into the methods used to lift and compare fingerprints as well as the methods to create casts and impressions for analysis.

In the second half of the course students will explore the process of death and decomposition, the stages of death, determining time and cause of death, and the role of forensic pathology. Forensic anthropology will introduce students to the study of human skeletal remains and the techniques used to identify individuals from bones. Students will also learn about DNA fingerprinting and how it is used in solving crimes. Students will explore blood and blood spatter analysis, drug identification and toxicology, handwriting analysis, forgery, and counterfeiting, tool mark analysis, and ballistics.

The course filled many hands-on labs and physical evidence to analyze from fictional crime scenes. The course also provides students with virtual simulations and a variety of true crime case studies.

COURSE PREREQUISITES

None

COURSE LENGTH

1 Semester (part B is another semester)

REQUIRED TEXT

Include in the course

COURSE LEARNING OUTCOMES

BIG IDEAS

UNIT 1 - OBSERVATION SKILLS

- Importance of observation in forensic science
- Techniques to improve observation skills
- Application of observational skills in crime scenes

CRIME-SCENE INVESTIGATION & EVIDENCE COLLECTION

- Types of evidence and their importance
- Crime-Scene Investigation Team
- Steps in processing a crime scene
- Proper methods for collecting, preserving, and documenting evidence
- Crime-scene reconstruction

HAIR ANALYSIS

- History of hair analysis
- Structure and function of hair
- Comparison and analysis of hair samples

FIBER AND TEXTILE ANALYSIS

- Types and properties of fibers and textiles
- Techniques for analyzing fibers
- Importance of fiber evidence in criminal investigations

POLLEN AND SPORE ANALYSIS

- Identification and classification of pollen and spores
- Collection and analysis methods
- Role of pollen and spores in linking suspects to crime scenes

SOIL ANALYSIS

- Composition and properties of soil
- Techniques for collecting and analyzing soil samples
- Soil as evidence in forensic investigations

GLASS ANALYSIS

- Types of glass and their forensic significance
- Methods for analyzing glass evidence
- Reconstructing events using glass fracture patterns

FINGERPRINT ANALYSIS

- History of fingerprinting
- Types and patterns of fingerprints
- Methods for detecting and lifting fingerprints
- Techniques for comparing fingerprint samples

CASTS AND IMPRESSIONS ANALYSIS

- Types of impressions and their significance
- Techniques for making and analyzing casts
- Use of impressions in identifying suspects and reconstruct crime scenes

DEATH

- Distinguish between four manners of death
- Examine cause, manner, and mechanisms of death
- Stages of death and decomposition
- Determining time and cause of death
- Role of forensic pathology in death investigations

FORENSIC ANTHROPOLOGY

- Study of human skeletal remains
- Techniques for identifying individuals from bones
- Applications of forensic anthropology in criminal cases

DNA FINGERPRINTING

- Process for how crime-scene evidence is collected for DNA analysis
- Techniques for DNA extraction, amplification, and analysis
- Use of DNA to determine relationship between individuals.

BLOOD & BLOOD SPATTER ANALYSIS

- Properties and composition of blood
- Determine blood type
- Techniques for analyzing blood and bloodstains
- Interpretation of blood spatter patterns to reconstruct events

DRUG IDENTIFICATION AND TOXICOLOGY

- Classification and effects of drugs and toxins
- Techniques for identifying drugs and toxins in biological samples
- Role of toxicology in forensic investigations

HANDWRITING ANALYSIS, FORGERY, AND COUNTERFEITING

- Principles of handwriting analysis
- Techniques for detecting forgery and counterfeit documents

TOOL MARKS

- Types of tool marks and their significance
- Methods for analyzing tool marks
- Role of tool marks in linking suspects to crime scenes

BALLISTICS

- Basics of firearms and ammunition
- Techniques for analyzing ballistic evidence
- Use of ballistics in reconstructing shooting incidents

SCIENTIFIC INQUIRY

This course is designed to help students use scientific inquiry to come to understand the natural world, and to learn about scientific concepts. Labs and activities are presented in a way to allow students to develop knowledge and understandings through interacting with their environment, asking questions, and seeking ways to answer those questions.

Scientific inquiry is a powerful way of understanding science content. Students learn how to ask questions and use evidence to answer them. In the process of learning the strategies of scientific inquiry, students learn to conduct an investigation and collect evidence from a variety of sources, develop an explanation from the data, and communicate and defend their conclusions.

Scientific Inquiry based learning allows students to design and perform experiments. Students should maintain an open and questioning mind to pose their own questions about objects, events, processes, and results.

ASSIGNMENT DESCRIPTIONS

- **Assignments** - Assignments give students an opportunity to practice skills learned in a lesson and apply understandings to real world situations. Examples of assignments are evidence analysis, forensic technique exploration, and court room testimonies.
- **Labs & Evidence Analysis** - Labs in this course are a combination of virtual and physical labs. You will receive a lab kit containing most of the materials required in the physical labs. Labs are designed to allow students the opportunity to learn forensic techniques or analysis evidence from a fictional crime scene. Virtual labs will be simulations that will explore different forensic concepts.
- **Case Studies** - Case Studies provide students with an intriguing cases drawn from actual forensic investigations that are tied to the unit concepts. Students are presented with questions, prompts, or discussion topics about the case studies that will promote critical thinking skills in the forensic world.
- **Unit Tests** - At the end of each unit students will take a Unit Test that will consist of a variety of questions types (multiple choice, short-answer, fill in the blank). Unit Tests will serve as a measurement of students understanding of the concepts from the unit and their ability to apply and transfer these understandings.
- **Concept Checks** - Concept Checks are intended as self-assessments for students to determine where their strengths and weaknesses are in their understanding of the unit concepts. Concept Checks will also serve as a way for students to communicate their instructors about questions they may have about the unit.

LAB KITS & SUPPLIES

Students will engage in virtual and physical labs throughout the course. Students will need the following materials and logins to complete the labs.

LAB KIT

You will need to order your lab kit by completing the form (link below). The kit will be shipped directly to your home and should take about 4-5 days to arrive. If you have any questions please contact your instructor.

<https://www.cmasas.org/lab-kit-request-form>

ADDITIONAL SUPPLIES

In addition to the supplies provided in the lab kit, students will also need to supply additional materials to complete the physical labs in the course.

[Extra Supply List](#)

GIZMO LABS

Students will need to register for an Explore Learning account. Use this worksheet to complete your registration.

Registration Directions

GRADING POLICY

High scores will be taken for each assignment and quiz. Students are expected to complete each assignment at Mastery level (80%) or higher.

Grades will be calculated as follows:

Scores in each category will be added together and divided by total possible points for that category and then multiplied by the weight of the category.

CATEGORY WEIGHTS

- Labs = 40%
- Unit Tests = 20%
- Assignments = 30%
- Case Studies = 10%

GRADE SCALE:

Percentage	Letter Grade	GPA
95 - 100	A	4.0
90 - 94.9	A-	3.7
87 - 89.9	B+	3.3
83 - 86.9	B	3.0
80 - 82.9	B-	2.7