

**Law, Public Safety, Corrections and Security Career Cluster**  
**Forensic Science and Criminal Investigations**  
**Course Number: 43.45200**

**Course Description:**

Forensic Science and Criminal Investigations is a course designed to contextualize scientific principles within the career studies of students interested in criminal justice. The course will utilize scientific equipment; therefore, instructors should have access to a science lab if their Career and Technical Education lab is not equipped. Students will study the forensic application of principles of chemistry, biology, physics and other disciplines. Students will utilize chromatography, electrophoresis, microscopic observation, and other scientific techniques in their studies. Students will also learn some investigative techniques and crime scene investigation skills through the lens of the scientific method. The prerequisites for this course are Introduction to Law, Public Safety, Corrections and Security and Criminal Justice Essentials.

**Course Standard 1**

**LPSCS-FSCI-1**

The following standard is included in all CTAE courses adopted for the Career Cluster/Pathways. Teachers should incorporate the elements of this standard into lesson plans during the course. The topics listed for each element of the standard may be addressed in differentiated instruction matching the content of each course. These elements may also be addressed with specific lessons from a variety of resources. This content is not to be treated as a unit or separate body of knowledge but rather integrated into class activities as applications of the concept.

**Standard: Demonstrate employability skills required by business and industry.**

The following elements should be integrated throughout the content of this course.

**1.1 Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities.**

Person-to-Person Etiquette	Telephone and Email Etiquette	Cell Phone and Internet Etiquette	Communicating At Work	Listening
Interacting with Your Boss	Telephone Conversations	Using Blogs	Improving Communication Skills	Reasons, Benefits, and Barriers
Interacting with Subordinates	Barriers to Phone conversations	Using Social Media	Effective Oral Communication	Listening Strategies
Interacting with Co-workers	Making and Returning Calls		Effective Written Communication	Ways We Filter What We Hear
Interacting with Suppliers	Making Cold Calls		Effective Nonverbal Skills	Developing a Listening Attitude
	Handling Conference Calls		Effective Word Use	Show You Are Listening
	Handling Unsolicited Calls		Giving and Receiving Feedback	Asking Questions
				Obtaining Feedback
				Getting Others to Listen

Nonverbal Communication	Written Communication	Speaking	Applications and Effective Résumés
Communicating Nonverbally	Writing Documents	Using Language Carefully	Completing a Job Application
Reading Body Language and mixed Messages	Constructive Criticism in Writing	One-on-One Conversations	Writing a Cover Letter
Matching Verbal and Nonverbal communication		Small Group Communication	Things to Include in a Résumé

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Improving Nonverbal Indicators		Large Group Communication	Selling Yourself in a Résumé
Nonverbal Feedback		Making Speeches	Terms to Use in a Résumé
Showing Confidence Nonverbally		Involving the Audience	Describing Your Job Strengths
Showing Assertiveness		Answering Questions	Organizing Your Résumé
		Visual and Media Aids	Writing an Electronic Résumé
		Errors in Presentation	Dressing Up Your Résumé

### 1.2 Demonstrate creativity by asking challenging questions and applying innovative procedures and methods.

Teamwork and Problem Solving	Meeting Etiquette
Thinking Creatively	Preparation and Participation in Meetings
Taking Risks	Conducting Two-Person or Large Group Meetings
Building Team Communication	Inviting and Introducing Speakers
	Facilitating Discussions and Closing
	Preparing Visual Aids
	Virtual Meetings

### 1.3 Exhibit critical thinking and problem solving skills to locate, analyze and apply information in career planning and employment situations.

Problem Solving	Customer Service	The Application Process	Interviewing Skills	Finding the Right Job
Transferable Job Skills	Gaining Trust and Interacting with Customers	Providing Information, Accuracy and Double Checking	Preparing for an Interview	Locating Jobs and Networking
Becoming a Problem Solver	Learning and Giving Customers What They Want	Online Application Process	Questions to Ask in an Interview	Job Shopping Online
Identifying a Problem	Keeping Customers Coming Back	Following Up After Submitting an Application	Things to Include in a Career Portfolio	Job Search Websites
Becoming a Critical Thinker	Seeing the Customer's Point	Effective Résumés:	Traits Employers are Seeking	Participation in Job Fairs
Managing	Selling Yourself and the Company	Matching Your Talents to a Job	Considerations Before Taking a Job	Searching the Classified Ads
	Handling Customer Complaints	When a Résumé Should be Used		Using Employment Agencies
	Strategies for Customer Service			Landing an Internship
				Staying Motivated to Search

### 1.4 Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity.

Workplace Ethics	Personal Characteristics	Employer Expectations	Business Etiquette	Communicating at Work
Demonstrating Good Work Ethic	Demonstrating a Good Attitude	Behaviors Employers Expect	Language and Behavior	Handling Anger
Behaving Appropriately	Gaining and Showing Respect	Objectionable Behaviors	Keeping Information Confidential	Dealing with Difficult Coworkers
Maintaining Honesty	Demonstrating Responsibility	Establishing Credibility	Avoiding Gossip	Dealing with a Difficult Boss
Playing Fair	Showing Dependability	Demonstrating Your Skills	Appropriate Work Email	Dealing with Difficult Customers

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Using Ethical Language	Being Courteous	Building Work Relationships	Cell Phone Etiquette	Dealing with Conflict
Showing Responsibility	Gaining Coworkers' Trust		Appropriate Work Texting	
Reducing Harassment	Persevering		Understanding Copyright	
Respecting Diversity	Handling Criticism		Social Networking	
Making Truthfulness a Habit	Showing Professionalism			
Leaving a Job Ethically				

### 1.5 Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply team work skills.

Expected Work Traits	Teamwork	Time Management
Demonstrating Responsibility	Teamwork Skills	Managing Time
Dealing with Information Overload	Reasons Companies Use Teams	Putting First Things First
Transferable Job Skills	Decisions Teams Make	Juggling Many Priorities
Managing Change	Team Responsibilities	Overcoming Procrastination
Adopting a New Technology	Problems That Affect Teams	Organizing Workspace and Tasks
	Expressing Yourself on a Team	Staying Organized
	Giving and Receiving Constructive Criticism	Finding More Time
		Managing Projects
		Prioritizing Personal and Work Life

### 1.6 Present a professional image through appearance, behavior and language.

On-the-Job Etiquette	Person-to-Person Etiquette	Communication Etiquette	Presenting Yourself
Using Professional Manners	Meeting Business Acquaintances	Creating a Good Impression	Looking Professional
Introducing People	Meeting People for the First Time	Keeping Phone Calls Professional	Dressing for Success
Appropriate Dress	Showing Politeness	Proper Use of Work Email	Showing a Professional Attitude
Business Meal Functions		Proper Use of Cell Phone	Using Good Posture
Behavior at Work Parties		Proper Use in Texting	Presenting Yourself to Associates
Behavior at Conventions			Accepting Criticism
International Etiquette			Demonstrating Leadership
Cross-Cultural Etiquette			
Working in a Cubicle			

### Support of CTAE Foundation Course Standards and Georgia Standards of Excellence L9-10RST 1-10 and L9-10WHST 1-10:

Georgia Standards of Excellence ELA/Literacy standards have been written specifically for technical subjects and have been adopted as part of the official standards for all CTAE courses.

## Course Standard 2

### LPSCS-FSCI-2

#### Utilize the methodologies of the “characteristics of science.”

- 2.1 Evaluate the importance of curiosity, honesty, openness, and skepticism in science.
- 2.2 Demonstrate using standard safety practices for all classroom laboratory and field investigations.
- 2.3 Identify and investigate problems scientifically.
- 2.4 Demonstrate using tools and instruments for observing, measuring, and manipulating scientific equipment and materials.
- 2.5 Demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.
- 2.6 Demonstrate communicating scientific investigations and information clearly.
- 2.7 Analyze how scientific knowledge is developed.
- 2.8 Demonstrate an understanding of important features of the process of scientific inquiry.

## Course Standard 3

### LPSCS-FSCI-3

#### Research and explain basic concepts of forensic science.

- 3.1 Explain Locard’s Exchange Principle, Frye Standard, and Daubert Ruling.
- 3.2 Categorize the differing types of evidence, including testimonials and physical and individual, as well as class evidence.
- 3.3 Identify and explain the fields of science that can assist in solving a crime including biology, chemistry, forensic anthropology and forensic pathology.
- 3.4 Describe the crime lab including equipment, safety and sanitation necessary, set-up, and work flow.
- 3.5 Discuss the chain of evidence and other legal considerations applied to scientific work performed in forensics.

## Course Standard 4

### LPSCS-FSCI-4

#### Differentiate the methods of medico-legal investigations of death.

- 4.1 Explain the process of performing an autopsy.
- 4.2 Research PMI (Post Mortem Interval).
- 4.3 Compare the five manners of death.
- 4.4 Distinguish the causes of death commonly associated with homicide.

## Course Standard 5

### LPSCS-FSCI-5

#### Apply the concepts of physics to a criminal investigation.

- 5.1 Demonstrate how the principles of fluid dynamics are used to reconstruct a crime scene, based on spatter evidence.
- 5.2 Explain the various physical laws used in studying ballistics.
- 5.3 Compare casings and bullets for potential matches to evidence exemplars.
- 5.4 Collect evidence created by pressure exerted on surfaces, such as tool marks, tire marks, and footwear.
- 5.5 Explain how physics is used in accident reconstruction.

## Course Standard 6

### LPSCS-FSCI-6

#### Connect principles of chemistry to criminal investigations.

- 6.1 Investigate how chemical analysis is used in arson investigations.
- 6.2 Predict the types of chemical compounds that might be found in a terrorism crime scene.
- 6.3 Examine how Spectrophotometry is used in forensics.
- 6.4 Differentiate between the various types of chromatography that are used in the crime lab and the evidentiary value of each.
- 6.5 Predict types of controlled substances based upon lab test results.
- 6.6 Explain how blood alcohol levels are tested and quantified.
- 6.7 Identify and describe toxins common to criminal investigations.
- 6.8 Describe the various agents used to develop latent fingerprints.
- 6.9 Distinguish between chemicals used in recovering impression evidence that has been damaged.

## Course Standard 7

### LPSCS-FSCI-7

#### Compare the various types of evidence investigated using a microscope.

- 7.1 Distinguish the types of microscopes used in the crime lab and explain their evidentiary value.
- 7.2 Classify the morphology of trace evidence such as hair, fibers glass and soil.
- 7.3 Describe the botanical features of organic controlled substances.
- 7.4 Explain how microscopes are used in impression evidence such as casings and tool marks.
- 7.5 Demonstrate using pedological applications to soil in criminal cases.
- 7.6 Research the impact of enhanced microscopes and other technology in the process of evaluating physical evidence.

## Course Standard 8

### LPSCS-FSCI-8

#### Assess applications from biological science to criminal investigations.

- 8.1 Validate Galton's three principles of fingerprints.
- 8.2 Demonstrate properly identifying, processing, and classifying fingerprints given various surfaces.
- 8.3 Apply forensic entomology to a scenario to determine approximate time of death.
- 8.4 Distinguish skeletal features using forensic anthropology to estimate gender, age, ancestry, health and cause of death.
- 8.5 Formulate a plan to process a crime scene to discover serological evidence.
- 8.6 Delineate the lab results of serological evidence by their evidentiary value.
- 8.7 Demonstrate constructing an estimated of time of death based upon the postmortem condition of anatomical features in a human.
- 8.8 Classify stages of decomposition.
- 8.9 Describe how Deoxyribonucleic Acid (DNA) is collected, amplified, examined, and how cross contamination can occur.
- 8.10 Compare DNA results using short tandem repeat patterns.
- 8.11 Explain why certain evidence yields better DNA than others.
- 8.12 Discuss emerging cellular evidence such as RNA (Ribonucleic Acid) and mDNA (mitochondrial Deoxyribonucleic Acid.)
- 8.13 Identify and explain points of comparison used in forensic odontology.

## Course Standard 9

### LPSCS-FSCI-9

#### **Explain how forensic science is used in the courtroom.**

- 9.1 Critique the legal standards used in court admissibility.
- 9.2 Appraise how scientists gain “expert witness” status.
- 9.3 Discuss how forensics is used in civil cases.
- 9.4 Assess cases of “junk” science to construct suggested standards for admissibility.
- 9.5 Explain the phenomena called the “CSI Effect.”

## Course Standard 10

### LPSCS-FSCI-10

#### **Demonstrate the skills needed to investigate a crime scene including preventing contamination when evidence is gathered.**

- 10.1 Demonstrate utilizing basic interview techniques to gather information from potential witnesses, including assessing nonverbal clues.
- 10.2 Demonstrate documenting, logging, and maintaining the chain of custody of evidence.
- 10.3 Demonstrate properly processing a mock crime scene.
- 10.4 Demonstrate reconstructing a crime scene based on evidence discovered and processed
- 10.5 Investigate the various criminological theories relating to evidence at a crime scene.
- 10.6 Explain ways serial offenders are investigated and how criminal profiling might be utilized based on crime scene evidence.