Virginia Department of Forensic Science (DFS)
Annual Retraining Seminar - 2026
14.5 Hours

Course Content:

Case Study: Ahreal Smith Homicide:

On January 13, 2022, the dayshift employee of a rural convenience store arrived at work to find the night shift cashier's car still in the parking lot, running. A call to police started a roller-coaster investigation with detectives working around the clock to find the missing woman, Ahreal Smith. For the next five days, every trick in the book was used to bring the case to a close and put a suspect behind bars.

Shifting gears, From First Responder to CSI:

Overview: This Lesson will encompass 1 hour of instruction by examining a case review of a 2025 attempted suicide. The instructor has firsthand knowledge on this topic as the instructor was a first responding officer and the crime scene investigator for this incident.

Topics of discussion.

- Introduction of Instructor.
- Overview of the location Berryville Va
- Overview of the operations of Berryville PD at the time of the incident
- Overview of the call for service as it was relayed to the first responders
- What was discovered as first responding units arrived
- Actions taken by first responding units.
- Formulation of a plan to work crime scene after victim was secured.
- Overview of the crime scene as it was processed.
- Discussion of challenges that were faced performing dual roles.
- Discussion of what went well and what could be improved upon
- Summary of Investigation.

Summary:
Following this lesson students will have an understanding of the challenges that face smaller agencies who must utilize multiple resources and perform dual tasks.

Laboratory Updates:

- Agency Leadership Changes
- Central Laboratory Project Completion
- Laboratory Accreditation (including relocation)
- Workload Statistics (Customer dashboard)
- Evidence Receiving Outreach
- Evidence Handling and Laboratory Capabilities Guide
- Prelog pilot plan
- Outsourcing (DNA and TX)
- Firearms notification update
- Breath Alcohol Instrumentation
- Rapid DNA and other technology updates

- Historical Reviews
- Section Reminders

Evaluation of the Use of Alternate Light Sources in the Search for Burned Skeletal Remains:

In searches for skeletal human remains, the ability to recover as complete an individual as possible is of utmost importance to the identification of the individual, the reconstruction of perimortem events, and to the ethical obligation to the family of the deceased to return their loved one's remains in as complete condition as possible. Previous studies have shown the effectiveness of conducting searches for skeletal remains using ALS at night and strongly support the use of ALS for either initial scene searches or for secondary searches to recover remains not discovered during previous daylight searches.

Because fluorescence of bone depends upon its chemical composition, degradation of bone due to thermal exposure poses a challenge to the use of ALS in searches for skeletal remains. This is pertinent to search contexts in which remains have been exposed to fire, such as house fires, vehicular accidents, or the use of cremation to mask a homicide.

This collaboration between Virginia Commonwealth University (VCU) and the Search and Rescue Tracking Institute (SARTI) sought to determine the most effective search conditions when thermally damaged remains are present and to develop recommendations for such searches. The conclusions of the study were:

- Increased thermal damage to bone was associated with decreased fluorescence, with a differential effect of the level of thermal damage on recovery rates.
- The recovery of brittle, fragmentary charred or calcined bone should be prioritized by using a primary daylight search, followed by secondary nighttime searches using ALS.
- No differences were found in recovery rates among UV, violet, and blue ALS wavelengths; however, UV or violet light were preferred in order to facilitate searcher safety, ease of navigation, and prevention of eye strain.
- ALS alone may not be sufficient for recovery of all skeletal elements when thermally damaged remains are present.

Detect More Evidence - Extend Your Search Beyond the Visible:

Various types of evidence are often overlooked at a crime scene because they are not visible to the naked eye. When using an alternate light source with the proper corresponding filter, it is still possible to miss items of evidence due to background interference or improper angle of illumination. The purpose of this lecture will be to introduce attendees to various methods utilized in detecting evidence beyond the visible range. An introduction to light theory and techniques utilizing wavelengths of light beyond the visible range on notoriously difficult surfaces will be discussed. This will include ultra-violet and infrared examination to detect the presence of biological fluids, and gunshot residue. Novel oblique lighting techniques will be explored to detect evidence on raised surfaces and footwear impressions. Bandpass filtering techniques will also be explored to aid in the detection of evidence at crime scenes.

Training Section Updates:

- Forensic Science Academy
- 2026 courses
- Mirrorless camera update

Following the Evidence: Solving a Multi-Jurisdictional Bank Robbery Series

This presentation examines the investigation of a single offender responsible for a series of bank robberies across York County, Smithfield, Henrico, and Newport News. Investigators will walk through how collaboration between jurisdictions and the combination of surveillance video, video processing, cellular data, fingerprint evidence, and financial records helped identify and track the suspect. The presentation will also highlight an important private-sector partnership with casino personnel, who used surveillance and transaction records to identify the suspect and ultimately alerted investigators when he returned to the casino.

Key Topics

- Connecting Four Jurisdictions — Linking bank robberies in York County, Smithfield, Henrico, and Newport News to a single offender.
- Surveillance Video — Collecting and comparing video evidence across multiple robbery locations.
- Processing Digital Video — How video evidence was processed to reveal additional investigative information.
- Cellular Data — Using cellular evidence to develop and corroborate investigative leads.
- Fingerprint Evidence — The importance of traditional forensic evidence in strengthening the case.
- The Casino Connection — How a casino manager and surveillance personnel flagged the suspect and provided real-time notification when he returned to the property.
- Flock- How to leverage LPR data
- Lessons Learned — The value of combining digital evidence, traditional forensics, information sharing, and private-sector partnerships.

Forensic Biology:

- Review the current capabilities of the VA DFS Forensic Biology section
  - Distinguish between examinations automatically pursued given information and findings vs. examinations LEA needs to specifically request on the submission form
  - Discuss PERK processing unit
  - Explain VA DFS case outsourcing procedure and how it affects LEA to include types of cases, evidence transfer, reports, subsequent submissions, and testimony
  - Discuss future technology projects
- Review VA DFS forensic biology current report format and what's new
- DNA data bank 101 – review organization, sample eligibility, "hit" process, and LEA responsibilities

Legal Update

Presentation and discussion of court decisions from the past year that directly affect the laws of Search & Seizure

Solving the Unsolvable: A Landmark Cold Case Sexual Assault Prosecution Involving Identical Twin DNA

Commonwealth v. Russell Marubbio examines a landmark cold-case sexual assault prosecution that highlights the successful integration of law enforcement investigation, forensic DNA science, and prosecutorial strategy to secure justice nearly four decades after the crime occurred.

The case arose from the December 19, 1987 sexual assault of D.L., a gas station employee in Woodbridge, Virginia. Although the offender remained unidentified for decades, investigators preserved critical biological evidence collected through a Physical Evidence Recovery Kit (PERK) and the victim's clothing. Advances in DNA technology ultimately enabled forensic scientists to reexamine the evidence and identify Russell Marubbio as the source of the DNA recovered from the victim's body and clothing.

The presentation will explore the investigative and forensic developments that transformed historical evidence into compelling proof, as well as the legal challenges associated with prosecuting a decades-old offense. Topics include evidence preservation, chain of custody, witness availability, authentication of historical records, expert DNA testimony, confrontation clause issues, and strategies for preserving and presenting victim testimony.

Presented by detectives, forensic experts, and prosecutors directly involved in the case, this session provides practical guidance on cold-case investigations and prosecutions. Attendees will gain valuable insight into multidisciplinary collaboration, emerging forensic technologies, and effective trial strategies for overcoming the unique challenges presented by aging criminal cases.

Learning Objectives

- Identify key investigative practices that contribute to successful cold-case sexual assault prosecutions, including evidence preservation, documentation, chain-of-custody maintenance, and long-term case management.
- Explain how advances in forensic DNA technology can be applied to historical sexual assault cases, including the analysis and interpretation of biological evidence preserved for decades involving twin DNA.
- Recognize the unique legal and evidentiary challenges presented by cold-case prosecutions, including witness availability, authentication of historical records, confrontation clause considerations, and admissibility of forensic evidence.

Basic Bloodstain Pattern Recognition

Objectives:

- To gain a basic understanding of what bloodstain pattern analysis is and how it can be helpful in crime scene investigations

- To provide a very basic understanding of different bloodstain patterns and ways to assist in identification