LATENT PRINT EXAMINER TRAINING MANUAL

Table of Contents

Revision History

Revision #	Description of Changes
1	*Ready for Qualtrax – no content changes*
2	Updated introduction to include requirements for DNA Database Card Comparisons; added Module 33: DNA Database Fingerprint Comparisons, added practical exercises for ThermaNin and 1,2, Indanedione TP and associated readings in appendix I
3	Break out modules for Latent Print Field Service Response and ABIS; further define general grading policy and applicability to individual assignments; slight wording and grammatical changes throughout.
4	Numbered practical exercises, modified introduction, removed Introduction to Crime Scenes unit, combined Taking Post Mortem Exemplars with unit on processing bodies for latent prints into new module - Advanced Latent Print Field Service Response, updated numbering, added readings to modules: 6, 14, 20, & 31, removed one reading from module 4, slight wording and grammatical changes throughout.
5	Convert to pdf following automated conversion system error - no other changes were made
6	Corrected info on Vucetich in Module 1, added written test for module 31, added/modified readings in modules 4, 28, & 29, slight wording and grammatical changes throughout.
7	Minor wording changes throughout, added sign offs for exercises, updated background in module 7 updated objectives in modules 1, 5, 7, & 24 updated practical exercises for modules 1-27, & 29, updated readings for modules 1, 3, 5-21, 25, & 32. Removed KSI from ALS module.
8	Minor wording changes throughout; changed ABIS to MBIS throughout, added column for written test grades; updated sections 6.4.2, 7.4.5, 16.3.1, 16.3.2, 18.4.3, 24.2.2, 32.4.2; updated title 11.0, 16.0, & 20.0; added sections 11.3.7, 11.3.8, 16.3.5-16.3.7, 31.4.13; removed Module 30.0 Advanced latent Print Field Service Response and associated readings and associated references; and updated readings in modules 5, 7, 9, 14, 16, 18, 20, 29 & 30.

9	Document reformatted to fix issues with Qualtrax PDF conversion. No technical content was changed.
10	Minor wording changes and updated numbering throughout; updated title 1.0; updated section 6.4.2; added Module 17- RECOVER LFT; added section 27.4.2; and updated readings in modules 4, 7, 17, 22, & 28.

1.0 Introduction

The purpose of this manual is to provide an in-house training program that will result in a competent and qualified expert Latent Print Analyst. This expert shall possess specialized knowledge, skills and training in the sub-disciplines of Latent Print Processing and Latent Print Comparison. In addition to establishing a minimum standard of professional competency, completion of this manual shall aid in maintaining quality and consistency among analysts within the section.

The training program, in its entirety, is designed for the Trainee who has little to no prior background or experience in the subject matter. The training program consists of two main segments: Latent Print Processing and Latent Print Comparison and two supplementary modules: Multimodal Biometric Identification System and DNA Database Card Comparison that may be used depending on work duties. Each segment is composed of a series of modules on specific topics. These modules consist of reading materials, observation and demonstration, and/or practical exercises. Each module has an associated test. Module tests shall evaluate the ability of the analyst to properly perform examinations and may be written, oral, hands-on or a combination thereof. They shall not be reviewed or verified prior to submission to the Trainer.

The modules outlined are the minimum requirements for completion of training. Additional exercises or readings may be assigned at the discretion of the Technical Lead, if necessary. The training may be abbreviated for analysts with prior experience and training or for those individuals who perform only limited duties. The background and experience of each individual will be assessed by the Technical Lead prior to the analyst beginning the training program. Training modules do not need to be completed in sequence. The order of completion may vary depending on the Trainee and/or operational needs.

All cases processed and examinations performed during training will be with the Trainee working as “the hands of the Trainer” as defined by the ISPFS Quality/Procedure Manual.

External training is used to supplement and/or meet certain portions of the training program. Trainees should attend workshops and/or training classes in the areas of latent print processing, latent print comparison, courtroom testimony, digital imaging, and photography. Attendance of outside training courses/workshops is subject to course availability and budget constraints. Requests for training shall be approved through the chain of command.

Progress is monitored by the Trainer, who reports to the Technical Lead and/or Supervisor. The Trainee must pass each written test with a minimum score of 80%. All tests are closed book unless otherwise noted. Many practical exercises require that the

Trainee search out or participate in a particular activity. These exercises are not graded and the Trainee or Trainer need only to document the date of occurrence. Other practical exercises will be graded "pass" or "fail" as noted. In order to receive a passing mark, the Trainee must demonstrate comprehension of the subject and demonstrate to the Trainer that they are able to complete the assignment with satisfactory results. If a practical exercise is assessed as "fail" the Trainee will be given additional training and/or additional exercises until competency is achieved. The Trainee must pass a final competency test and mock court in each of the sub-disciplines: Latent Print Processing and Latent Print Comparison. Competency tests and mock courts are also "pass" or "fail". Should the Trainee provide incorrect results or inaccurate testimony during these exercises additional training or testing will be necessary and mock courts may be repeated. Training is considered complete upon formal approval by the Quality Manager. This training program is estimated to last 18-24 months. The actual pace of instruction is dictated by agency resources and needs, as well as the Trainee's progress and demonstrated proficiency.

Modules for Latent Print Processing Sign Off

Module 1: History and Background of Friction Ridge Identification _____ _____
Trainer Date

Module 2: Other Scientific Personal Identification Methods _____ _____
Trainer Date

Module 3: Safety Training _____ _____
Trainer Date

Module 4: Case Management and Reporting for Processing _____ _____
Trainer Date

Module 5: Digital Preservation of Latent Prints _____ _____
Trainer Date

Module 6: General Latent Print Processing _____ _____
Trainer Date

Module 7: Processing Technique – Alternate Light Sources _____ _____
Trainer Date

Module 8: Processing Technique – Amido Black _____ _____
Trainer Date

Module 9: Processing Techniques – 1, 8, Diazafluoren-9-One (DFO) and 1, 2, Indanedione _____ _____
Trainer Date

Module 10: Processing Technique – Dye Stains – Rhodamine 6G and RAM _____ _____
Trainer Date

Module 11: Processing Technique – Gentian Violet/Crystal Violet _____ _____
Trainer Date

Module 12: Processing Technique – Iodine _____ _____
Trainer Date

Module 13: Processing Technique – Leuco Crystal Violet (LCV) _____ _____
Trainer Date

Module 14: Processing Technique – Ninhydrin _____ _____
Trainer Date

Module 15: Processing Technique – Powder Development of Latent Prints _____ _____
Trainer Date

Module 16: Processing Technique – Physical Developer (PD) _____ _____
Trainer Date

Module 17: Processing Technique – RECOVER LFT _____ _____
Trainer Date

Module 18: Processing Technique – Small Particle Reagent (SPR) _____ _____
Trainer Date

Module 19: Processing Technique – Sticky Side Powder _____ _____
Trainer Date

Module 20: Processing Technique – Sudan Black _____ _____
Trainer Date

Module 21: Processing Technique – Cyanoacrylate Ester (Super Glue®) _____ _____
Trainer Date

Module 26: Introduction to Latent Prints and the State of the Science _____ _____
Trainer Date

Module: 30: Court Procedures, Related Laws, Expert Testimony, Criminal and Civil Procedures Applicable to Latent Prints (reading & processing portions only) _____ _____
Trainer Date

Modules for Latent Print Comparison Sign Off

Module 1: History and Background of Friction Ridge Identification

_____ _____
Trainer Date

Module 2: Other Scientific Personal Identification Methods

_____ _____
Trainer Date

Module 5: Digital Preservation of Latent Prints

_____ _____
Trainer Date

Module 22: Digital Imaging

_____ _____
Trainer Date

Module 23: Biology and Physiology of Friction Ridge Skin

_____ _____
Trainer Date

Module 24: Recording Inked Fingerprints, Palm Prints and Footprints

_____ _____
Trainer Date

Module 25: Friction Ridge Pattern Recognition and Interpretation

_____ _____
Trainer Date

Module 26: Introduction to Latent Prints and the State of the Science

_____ _____
Trainer Date

Module 27: Human Factors

_____ _____
Trainer Date

Module 28: Analysis, Comparison, Evaluation, and Verification (ACE-V)

_____ _____
Trainer Date

Module 29: Case Management and Reporting for Comparison and/or MBIS

_____ _____
Trainer Date

Module 30: Court Procedures, Related Laws, Expert Testimony, Criminal and Civil Procedures Applicable to Latent Prints (reading & comparison and/or MBIS portions only)

_____ _____
Trainer Date

Module for Multimodal Biometric Identification System Sign Off

Module 31: Multimodal Biometric Identification System – NOTE completion of Latent Print Comparison is a pre-requisite for MBIS.

_____ _____
Trainer Date

Module for DNA Database Card Comparison Sign Off

Module 32: DNA Database Fingerprint Comparison

_____ _____
Trainer Date

2.0 Roles and Responsibilities

2.1 Supervisor

The Supervisor shall maintain an employee training file with all associated authorizations and shall evaluate mock court testimony.

2.2 Technical Lead

The Technical Lead shall assess any prior applicable training, review and/or modify the current training plan to reflect the analyst's prior training, assign the appropriate modules, and organize the training. The Technical Lead should regularly monitor the Trainee's progress and review their training record for completeness and accuracy, procure final competency tests, and schedule mock courts. The Technical Lead shall provide input regarding mock court performance to the Supervisor and/or other members of management. At the completion of Latent Print Processing and/or Latent Print Comparison training, the Technical Lead shall review all documentation regarding training to determine if the Trainee performed all required training and is competent to perform analysis. If the Trainee is competent to perform analysis, the Technical Lead shall forward all required documentation to the Quality Manager. The Technical Lead may designate an onsite Trainer.

2.3 Trainer

The Trainer shall provide a copy of the training plan to the Trainee with an anticipated timeline for completion. The Trainer is responsible for coordination of practical exercises, demonstrating techniques, reviewing assignments, providing feedback, and administration of module tests. The Trainer should monitor for comprehension and competency in theoretical knowledge and basic practical skills. The Trainer shall communicate progress, delays, or the need for supplemental activities to the Technical Lead and/or Supervisor. Deficiencies should be openly discussed among the Trainee, Trainer, Technical Lead and/or Supervisor in an attempt to rectify them.

2.4 Trainee

The Trainee shall maintain a record of training. This record shall include, but is not limited to: daily training received, observed events, activities performed by the Trainee, court testimony observed or performed, field cases observed or performed, completed assignments, and checklists. All steps in training shall be documented as they are completed. The record shall include a list of training samples that are utilized for hands-on processing exercises as well as the methods used to process them. With regards to comparison and/or MBIS training, the

record will include a list of cases utilized as practical comparison exercises and associated statistics (number of latent prints examined, number of comparisons performed, and number of identifications). The ILIMS training program may be utilized to record events or specific conclusions during training.

The Trainee should provide a weekly report to the Technical Lead and/or Trainer to include activities accomplished during the week (readings/exercises completed, casework observed, classes attended, etc.). They should keep the Technical Lead and/or their Trainer informed of any problems or questions that may arise.

At the completion of the Latent Print Processing or Latent Print Comparison segment, the Trainee will advance to supervised case work. Supervised case work will not commence until approval has been granted by the Quality Manager. At such time, a record of all cases, associated statistics, and the identity of the supervising analyst will be kept for all Latent Print Processing or Latent Print Comparison supervised case work.

The Trainee shall ensure that all training records for outside classes are forwarded to the Quality Manger for inclusion in his/her training file and shall ensure that their curriculum vitae accurately reflects successfully completed training.

3.0 Module 1: History and Background of Friction Ridge Identification

3.1 Background and Theory

Friction ridge identification has been relied upon for over 100 years to provide accurate identification. Fingerprints were originally used as signatures when signing business transactions and official government documents. In 1686, Professor Malpighi at the University of Bologna in Italy made observation of spirals, loops and ridges in fingerprints using the newly invented microscope. In 1858, Sir William Herschel was using fingerprints to "sign" documents. It was during this time that he noticed that no two prints were exactly alike and realized that they could be used for personal identification purposes. In the 1880's Henry Faulds was studying the permanency of friction ridge skin and was the first to publicly suggest that fingerprints could be used to identify criminals.

In 1888, Sir Francis Galton became the first person to provide evidence that no two fingerprints were exactly the same and that the prints remain the same throughout a person's lifetime. He calculated that the odds of finding two identical fingerprints were 1 in 64 billion. He went on to publish the first book on the subject titled "Finger Prints" in 1892, in which he detailed the first classification system for fingerprints. In his book, he identified three pattern types (loop, whorl, and arch).

In South America, Juan Vucetich developed his own system of classification by 1891 and published a book "Comparative Fingerprinting" (Dactiloscopia Comparada) in 1904. The first criminal fingerprint identification in a murder investigation came in 1892 by Police Inspector Alvarez, an Argentine police official trained by Vucetich.

In 1896, Sir Edward Richard Henry created a fingerprint classification system of his own in British India, which later spread to England. The Henry Classification system was used to establish a Fingerprint Bureau at Scotland Yard.

In 1902, New York was the first state in the United States to start implementing the new fingerprint technology. Within the next year, law enforcement agencies and military branches all over the United States started implementing their own identification departments.

Between 1911 and 1914, Edmund Locard established the first set of rules for fingerprint identification. Locard claimed that if there were 12 points of

agreement between prints with no disagreements, the identity was confirmed beyond doubt. This standard was formally adopted in many countries except for the United States who moved away from a standard based on counting points.

By the 1990's, Automated Fingerprint Identification Systems (AFIS) were being widely used. Currently, tens of thousands of individuals are added to repositories daily. These fingerprint collections provide the basis for criminal history records maintained by local, state, and federal law enforcement agencies.

The basic methodology for friction ridge identification has remained relatively unchanged. As other disciplines of forensic science continue to develop accurate statistics for their results, friction ridge identification seeks to quantify their own results. While still in its infancy, studies are beginning to surface based around this type of research.

3.2 Objectives, Principles, and Knowledge

3.2.1 Understand the purpose of early methods of personal identification (Bertillon system, photography, scars, tattoos, sight recognition, marks, and mutilations).

3.2.2 Knowledge of the earliest recorded awareness of fingerprints (cliff dwellers-Chinese) and be able to recall the earliest known uses of friction ridge impressions as a means of identification in China, Japan, and India.

3.2.3 Knowledge of early anatomical observations (Grew, Malpighi, Purkinje, et. al.) and understand the biological significance of friction skin ridge patterns and their formation.

3.2.4 Understand the scientific observations and use of fingerprints leading to modern friction ridge identification. Be able to recall the contributions of notable friction ridge pioneers to include: Locard, Herschel, Faulds, Galton, Vucetich, Henry, Holland, Cummins, and Ashbaugh.

3.2.5 Knowledge of the historical events that led to the introduction and use of fingerprints in England (Belper Committee, Troup Committee) and in the United States (Thompson, Twain, DeForest, Ferrier, NY Prison System, Will/William West, establishment of the FBI Identification Division).

3.2.6 Knowledge of the current criminal and civil applications of fingerprints, palm prints, and footprints and how these applications developed in the United States.

3.2.7 Knowledge of the existence and development of various criminal and civil fingerprint files (FBI, U.S. military medical records, state and local fingerprint and palm print repositories).

3.3 Health and Safety Hazards

3.3.1 N/A

3.4 Reading and Practical Exercises

3.4.1 Complete Module 1 reading list

_____	_____	_____
Trainee	Trainer	Date

3.4.2 Practical Exercise I - Write a short synopsis of the contributions of each of the following figures: Herschel, Faulds, Galton, Vucetich & Henry. This exercise is Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

3.4.3 Practical Exercise II - visit http://onin.com to familiarize yourself with this web site; with regards to this module visit: http://onin.com/fp/fphistory.html.

_____	_____	_____
Trainee	Trainer	Date

3.4.4 Practical Exercise III – devise a game or other activity that will incorporate all of the names and historical events that are detailed in the Objectives, Principles, and Knowledge Section above as well as any others from your reading that you feel are particularly notable. Discuss your idea with your trainer prior to implementing/creating the game or activity. This should be a fun activity that will allow you and others to use the information as a study tool, think Jeopardy, Trivial Pursuit, crossword puzzle, rap song etc. NOTE: this activity will be carried throughout your training. You will continue to add to it with each module. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

3.5 Written Test – Module 1

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

4.0 Module 2: Other Scientific Personal Identification Methods

4.1 Background and Theory

Great strides have been made with regards to personal identification methods. In the late 1800's to early 1900's, agencies relied upon various methods of personal identification, including photography and anthropometry. The most common of these was the Bertillon method that utilized a person's physical measurements to prove identity. Those systems were replaced in the early 1900's by fingerprint identification. While fingerprint identification is still the most widely used system for personal identification, there are a number of other current personal identification methods of which a practitioner should be aware. These include DNA, odontology, handwriting and voice analysis, as well as various biometric techniques. Biometric verification is becoming increasingly popular in corporate and public security systems due to the rise in security breaches and transaction fraud. Biometrics use distinctive, measurable, physical, and behavioral characteristics to differentiate individuals. The physical characteristics used for biometric authentication include fingerprints, palm veins, facial recognition, DNA, palm print, hand geometry as well as iris or retina recognition. This information is often interpreted by a computer system that confirms identity.

4.2 Objectives, Principles, and Knowledge

4.2.1 Awareness of personal identification methods other than friction ridge skin to include biometrics, iris recognition, face recognition, vascular pattern recognition, hand geometry question document analysis, voice analysis, odontology, and DNA.

4.2.2 Awareness of the advantages/disadvantages of each.

4.3 Health and Safety Hazards

4.3.1 N/A

4.4 Reading and Practical Exercises

4.4.1 Complete Module 2 Reading List

_____	_____	_____
Trainee	Trainer	Date

4.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate each of the relevant terms located in the Objectives, Principles, and Knowledge Section above as well as any others from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

4.4.3 Practical Exercise II - Discuss with your trainer why it is important to be aware of other forms of personal identification and how that knowledge or lack thereof may impact casework and testimony. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

4.5 Written Test – Module 2

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

5.0 Module 3: Safety Training

5.1 Background and Theory

Safety in the laboratory is an essential part of the job of a Forensic Scientist. The Occupational Safety & Health Administration (OSHA) was created in 1970 to protect workers. It mandates that each laboratory worker be knowledgeable about blood borne pathogens, chemical hygiene, universal precautions, biohazard disposal, decontamination, and vaccinations. It requires that all of the applicable information for the lab is given to the employee so that they may maintain safety in the workplace. It is also imperative that employees are able to access the Safety Data Sheets (SDS) in their laboratory in order to maintain safety around applicable chemicals.

5.2 Objectives, Principles, and Knowledge

5.2.1 Understand safety hazards associated with the latent prints laboratory.

5.2.2 Knowledge of spill procedures/equipment and the use of personal protective equipment.

5.2.3 Knowledge of the potential explosion, fire, and contamination safety hazards associated with latent print development powders, solvents and chemicals.

5.2.4 Proper disposal of chemicals.

5.3 Health and Safety Hazards

5.3.1 N/A

5.4 Reading and Practical Exercises

5.4.1 Complete Module 3 Reading List

_____ _____ _____
Trainee Trainer Date

5.4.2 Practical Exercise I - Trainer led session on section safety equipment (location of Safety Data Sheets, spill kits, eye washes, fire extinguishers); chemical storage and disposal; and forms and labeling requirements (bottle labels, hazard labels, reagent logs, equipment maintenance logs, control test logs, image deletion logs, etc.). The trainee shall demonstrate this knowledge by guiding the Discipline Lead or designee on a tour of the above listed items and showing them how/where to access the items. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

5.5 Written Test – Module 3

_____ _____ _____ _____
Trainee Trainer Date Grade

6.0 Module 4: Case Management and Reporting for Processing

6.1 Background and Theory

In forensic science, it is imperative that procedures are accurately followed and documented appropriately. All documentation done for a case is subject to scrutiny by peers, the laboratory system, the courts, and accrediting bodies. Documentation should be as precise and error-free as possible.

It is important that measures are taken to prevent loss, deleterious change or tampering of evidence. Evidence should be tracked both internally (within the lab) and externally, as it transitions from agency to agency or person to person. This is done through chain of custody. When in the custody of an analyst, evidence integrity shall be ensured by properly securing, processing, marking, documenting, and re-sealing the evidence.

The system that is used to track information regarding a case is the Idaho Laboratory Information Management System (ILIMS). This system includes the internal chain of custody, information given to ISPFS by the submitting agency regarding the case, case correspondence, analyst generated notes and/or photographs, and all reports generated in relation to the evidence. The ILIMS system was implemented in 2013 to make all evidence processing paperless, efficient, and to afford timely access of records to submitting agencies and officers of the court. Comparison quality images are maintained in the Foray Digital Workplace database.

6.2 Objectives, Principles, and Knowledge

6.2.1 Knowledge of, and the ability to demonstrate, proper procedures for maintaining chain of custody (documentation and physical control).

6.2.2 Knowledge of, and the ability to demonstrate, proper procedures for handling and marking physical evidence received for examination.

6.2.3 Ability to navigate and query ILIMS for latent print processing cases.

6.2.4 Ability to demonstrate proper procedures for documentation of latent print processing casework. Documentation shall be such that another qualified Latent Print Examiner could evaluate what was done and why.

6.2.5 Understand how to prevent contamination.

6.2.6 Knowledge of, and the ability to demonstrate, proper procedures for reporting latent print processing examination findings in an accurate, concise, and clear manner.

6.2.7 Understand release of information policies, i.e. with whom, when, and how results may be given to customers.

6.3 Health and Safety Hazards

6.3.1 N/A

6.4 Reading and Practical Exercises

6.4.1 Complete Module 4 Reading List

_____	_____	_____
Trainee	Trainer	Date

6.4.2 Practical Exercise I – ILIMS Latent Print Orientation - shadow three different examiners and observe the completion of at least two processing cases from start to finish, to include evidence check-in/out and writing latent print processing reports in ILIMS – Trainer led discussion and demonstration.

_____	_____	_____	_____
Trainee	Trainer	Date	Case
_____	_____	_____	_____
Trainee	Trainer	Date	Case
_____	_____	_____	_____
Trainee	Trainer	Date	Case

Practical Exercise II – Hands of the Trainer

Upon completion of the processing method modules, the trainee will process casework samples while under constant observation by the trainer or designated qualified analyst in custody of the items. The trainee will handle, examine and perform testing on each item. The case analyst will provide case documentation, with a comment in the notes indicating analysis was performed by the trainee under direct supervision of the case analyst. The report will be issued by the qualified analyst/trainer.

_____	_____	_____	_____
Trainee	Trainer	Date	Case
_____	_____	_____	_____
Trainee	Trainer	Date	Case
_____	_____	_____	_____
Trainee	Trainer	Date	Case
_____	_____	_____	_____
Trainee	Trainer	Date	Case

6.4.3 Practical Exercise III – Trainee shall independently produce three latent print processing case reports. This exercise is Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

6.4.4 Practical Exercise IV – Technical review training for processing cases - Trainer led discussion and/or demonstration.

_____	_____	_____
Trainee	Trainer	Date

6.4.5 Practical Exercise VI – Trainee shall perform administrative and technical review on at least ten processing case reports, authored by examiners other than their Trainer(s). The Trainer will be the reviewer of record and ultimately responsible for the review on these cases. Pass/Fail.

Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case

6.5 Written Test – Module 4

Trainee	Trainer	Date	Grade

7.0 Module 5: Digital Preservation of Latent Prints

7.1 Background and Theory

Photography is widely used in Forensic Science. It dates back to the 1800s, when collections of photographs of criminals would hang in police stations for identification purposes. Today, we use digital photography for documentation of crime scenes, victim injuries and/or death, retrieval of evidence, and preservation of evidence. Digital cameras contain a sensor that records color and brightness values. These values are stored electronically and interpreted by computers. In general, the higher the resolution, the more information captured.

As with other evidence related to a case, evidentiary photographs should be properly captured, stored, and tracked to ensure their admissibility in court. Photography may be utilized at any point in the processing of evidence for latent prints, e.g. overall documentation of the evidence item, photographs of particular latent prints, to show orientation on an object, or final condition of an item. When photographing latent print evidence for comparison purposes, it is important to include both the impression and a scale. A variety of photographic techniques may be employed and will depend largely on the substrate as well as the particular development technique utilized on the item. Some of these techniques will require the use of an alternate light source (ALS) and specialized camera filters.

7.2 Objectives, Principles, and Knowledge

7.2.1 Understand the proper procedures for camera capture and digital scanning of latent and inked print images.

7.2.2 Familiarization with common digital photography terminology to include camera parts (body, lens, shutter diaphragm and shutter release) and function, file types (JPEG, RAW, TIF), compression, resolution, depth of field, bracketing, f-stop, shutter speed, aperture, exposure, etc.

7.2.3 Understand the different types of cameras and their suitability for latent print photography.

7.2.4 Understand the interplay between aperture and depth of field, aperture and shutter speed, and ISO. They shall know how to change these settings and why it may be applicable to do so.

7.2.5 Knowledge of and ability to apply special requirements for category 1 vs. category 2 images.

7.2.6 Understand the properties of light and how those properties relate to the use of filters and lighting techniques (oblique lighting, diffuse lighting, co-axial lighting, ALS lighting with appropriate filters, bounce lighting, etc.)

7.2.7 Ability to photograph chemically treated and powder developed latent prints of various colors.

7.2.8 Ability to photograph three dimensional impressions (plastic prints).

7.2.9 Use and maintenance of cameras and other equipment.

7.3 Health and Safety Hazards

7.3.1 As with all electrical appliances, guard against electrical shock. This can be accomplished by ensuring that all connections are proper and that no loose, damaged, or frayed wires exist. Make sure the camera, scanner, and/or ALS is unplugged before attempting any maintenance and do not use outdoors if wet conditions exist.

7.3.2 The eyes are generally more vulnerable than the skin, and appropriate eye protection must be used to protect them. Permanent eye damage can occur from reflected, refracted, or direct illumination to the eye. Most of the light emitted by an ALS is not absorbed, but is reflected and scattered off the surface being examined. Extreme care should be taken around highly reflective surfaces. Never look directly into the light or allow beams to bounce off the surface into your eyes or the eyes of another person in the vicinity. Filtered goggles or shields shall be utilized when using this equipment as they provide protection from potentially harmful rays and provide additional enhancement for viewing latent prints.

7.3.3 The nature and extent of all potential hazards are not yet known because in-depth assessments have not been made on most of the high intensity light sources used in forensic identification work.

7.4 Reading and Practical Exercises

7.4.1 Complete Module 5 Reading List

_____ _____ _____
Trainee Trainer Date

7.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate each of the relevant terms in the Objectives, Principles, and Knowledge Section above as well as any others from your reading that you feel are particularly notable. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

7.4.3 Practical Exercise II – Photography - Trainee will need to familiarize themselves with the camera equipment (cameras, lenses, copy stand) and camera software utilized in the laboratory.

7.4.3.1 Trainee will be able to identify basic camera components (body, lens, shutter diaphragm and shutter release) and demonstrate how to change lenses, shutter speed and aperture both manually and via computer camera software. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

7.4.3.2 Trainee will demonstrate to the Trainer that they understand the interplay between aperture and depth of field, aperture and shutter speed, and ISO. This should be done through a series of photographs with known f-stops/shutter speeds/ISO combinations. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

7.4.3.3 Trainee will explain the advantages/disadvantages to the different file formats (JPEG, TIFF, & RAW), and be able to define compression, lossy vs. lossless, f-stop, bracketing, depth of field, resolution, bit vs. Byte, SLR, DSLR, and pixel. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

7.4.3.4 Trainee will understand and be able to demonstrate various lighting techniques to include: Oblique lighting, diffuse lighting, co-axial lighting, ALS lighting with appropriate filters, bounce lighting, etc. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

7.4.3.5 Macro photography. Write a short synopsis on "What is macro photography." Practice taking macro photos utilizing the information garnered from research. Present three photos (one must be evidentiary in nature) to the Trainer. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

7.4.4 Practical Exercise III – Flatbed Scanner - Trainer led lesson on digital acquisition devices to include flatbed scanners and cameras. The Trainee will utilize these devices on training samples to include patent prints, plastic prints, and prints developed with a variety of processing techniques. Images captured from training samples will be evaluated by the Trainer. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

7.4.5 Practical Exercise IV – Digital Imaging System - Trainer led lesson on the digital imaging system to include navigation, features, how to upload, storage settings and locations, etc. The Trainee will acquire training images from multiple devices into the digital imaging system as practice. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

7.4.6 The Trainee should attend a week long basic photography course or a more specialized latent fingerprint photography course, if available (attach copy of certificate).

_____ _____ _____
Trainee Trainer Date

7.5 Written Test – Module 5

_____ _____ _____ _____
Trainee Trainer Date Grade

8.0 Module 6: General Latent Print Processing

8.1 Background and Theory

Latent print visualization may be achieved using various visual, physical, or chemical processes, most of which have evolved during the past century. There are three types of friction ridge impressions: latent, patent, and plastic. Latent prints are hidden until a physical or chemical process makes them visible. Although latent means hidden, it has become synonymous will all types of crime scene and evidence impressions. A patent print is a visible print. Examples of patent prints may be those left in blood, paint, dust, etc. A plastic print is a three-dimensional print, for example, those left in clay, wax, melted plastic, or tacky paint.

Prior to any latent print processing, a thorough visual inspection of the evidence should be conducted, using a strong light source.

Deciding what technique(s) to use to develop latent print evidence depends on several factors including: type of latent print residue, type of substrate, texture of substrate, condition of substrate (clean, dirty, sticky), known environmental conditions during or following latent print deposition, length of time since deposition, consequences of destructive processing methods, subsequent forensic examinations, and sequential ordering of reagents/development techniques.

8.2 Objectives, Principles, and Knowledge

8.2.1 Knowledge of the generally accepted techniques for the detection and visualization of friction ridge impressions.

8.2.2 Knowledge of latent print residue components targeted by different chemical development procedures.

8.2.3 Ability to assess the effectiveness and results of applied processing techniques.

8.2.4 Understand generally accepted preservation methods for friction ridge impressions.

8.2.5 Knowledge of surface and environmental factors affecting selection and sequencing of chemical development procedures.

8.2.6 Knowledge of the effects of various solvents on evidence surfaces (inks, plastics, varnishes, etc.).

8.2.7 Knowledge of equipment maintenance relative to chemical development of latent prints.

8.3 Health and Safety Hazards

8.3.1 N/A

8.4 Reading and Practical Exercises

8.4.1 Complete Module 6 Reading List

_____ _____ _____
Trainee Trainer Date

8.4.2 The Trainee should attend a Latent Fingerprint Processing/Chemical course (36 hour minimum - attach certificate when completed).

_____ _____ _____
Trainee Trainer Date

8.4.3 Practical Exercise I – Locate two articles regarding the water content of fingerprints (the more recent the better). Consider how the information regarding this topic has changed. Prepare a talk, power point, or poster that will allow you to present your findings to the section. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

8.4.4 Practical Exercise II – Devise a sequential processing plan on how you might process each of the following items: a smooth river rock, a dark colored glossy magazine page, a tree branch with bloody impressions. Present your ideas to your trainer and explain your reasoning for why you chose that particular sequence. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

8.5 Written Test – Module 6

_____ _____ _____
Trainee Trainer Date

8.6 Processing Competency Test- Trainee will independently process a mock case. A minimum of two item types will be processed using sequential processing. This competency test will be entered into ILIMS, and as such, Trainee will need to complete all appropriate documentation and attachments, and issue a report.

_____ _____ _____
Trainee Trainer Date

8.7 Supervised Cases – Complete 20 Supervised Processing Cases. Trainee shall record all case numbers, associated stats, and the identity of the supervising analyst.

_____ _____ _____ _____
Trainee Trainer Date Grade

9.0 Module 7: Processing Technique – Alternate Light Sources

9.1 Background and Theory

Visible light consists of electromagnetic radiation of differing colors and wavelengths. Wavelengths at approximately 700 nm are viewed as red light while wavelengths approximate to 400nm are viewed as violet light. To visualize latent prints via fluorescence, a specific wavelength of radiation is absorbed by either an untreated latent print or one treated with a fluorescent chemical or powder and then re-emitted at a differing wavelength. The wavelengths chosen on the Alternate Light Source (ALS) may be determined by the inherent luminescent nature of the print, the specific chemical or powder utilized for processing, or the luminescent nature of the substrate. Evidence is viewed and photographed with various filters dependent upon the specific wavelength used.

9.2 Objectives, Principles, and Knowledge

9.2.1 Knowledge of luminescence, fluorescence, inherent luminescence, light wavelengths, band-pass filters, and light delivery systems as they relate to ALS detection of latent prints.

9.2.2 Knowledge of dye stain procedures used post-cyanoacrylate and the need for ALS processing.

9.2.3 Knowledge of 1, 8-Diazafluoren-9-One (DFO), 1, 2 – Indanedione, and the need for ALS processing.

9.2.4 Knowledge of equipment maintenance relative to ALS detection of latent prints.

9.3 Health and Safety Hazards

9.3.1 As with other electrical appliances, guard against electrical shock. This can be accomplished by ensuring that all connections are proper and that no loose, damaged, or frayed wires exist. Make sure the ALS is unplugged before attempting any maintenance and do not use outdoors if wet conditions exist.

9.3.2 The eyes are generally more vulnerable than the skin, and appropriate eye protection must be used to protect them. Permanent eye damage can occur from reflected, refracted, or direct illumination to the eye. Most of the light emitted by an ALS is not absorbed, but is reflected and scattered off the surface being examined. Extreme care should be taken around highly reflective surfaces. Never look directly into the light or allow beams to bounce off the surface into your eyes or the eyes of another person in the vicinity. Filtered goggles or shields shall be utilized when using this equipment as they provide protection from potentially harmful rays and provide additional enhancement for viewing latent prints.

9.3.3 The nature and extent of all potential hazards are not yet known because in-depth assessments have not been made on most of the high intensity light sources used in forensic identification work.

9.4 Reading and Practical Exercises

9.4.1 Complete Module 7 Reading List

_____	_____	_____
Trainee	Trainer	Date

9.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three terms located in the Objectives, Principles, and Knowledge Section above as well as any others from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

9.4.3 Practical Exercise II – Trainer led demonstration on the application and preservation of ALS visualized prints to include inherent luminescence followed by hands-on examination/preservation by the Trainee utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

9.5 Written Test – Module 7

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

10.0 Module 8: Processing Technique – Amido Black

10.1 Background and Theory

Blood is composed of red blood cells, white blood cells and platelets, suspended in plasma. Red blood cells contain hemoglobin, a protein that carries oxygen from the respiratory organs to the remainder of the body. This protein is made up of four heme groups. There are two types of blood enhancement methods used in forensics: ones that react with the heme group to imply that blood is present and ones that react with proteins and their breakdown products. The methods that react with proteins are not specific to blood, but still tend to be sensitive methods due to the quantity of protein and protein breakdown products available in blood. Amido Black is a stain used in the latent print section to enhance the protein component of bloody prints. If blood is suspected, other presumptive blood testing techniques may need to be utilized.

10.2 Objectives, Principles, and Knowledge

10.2.1 Basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

10.2.2 Demonstrate proper chemical application and preservation of developed prints.

10.2.3 Demonstrate proper mixing, use of controls, documentation, storage, and disposal.

10.3 Health and Safety Hazards

10.3.1 Gloves, lab coats, goggles, and respirators (if there is a chance of the reagents becoming airborne) are worn when mixing or using Amido Black.

10.3.2 Glacial acetic acid is corrosive and extremely irritating to the eyes and respiratory system. Avoid breathing the vapors and use in a fume hood, with a respirator, or with adequate ventilation. Glacial Acetic Acid will cause burns if it comes in contact with skin.

10.3.3 Methanol is flammable. It needs to be handled carefully with gloves during the mixing and use of Amido Black. Methanol is toxic in quantities as small as 30 ml and should not be allowed to come in contact with the skin, eyes, or mouth. It is possible for methanol to be absorbed through the skin. If methanol comes into contact with the eyes or mouth, the area should be flushed with generous amounts of water and a doctor may be consulted. Inhalation of methanol vapors should be kept at a minimum and the solution should be used in a hood or well-ventilated area.

10.3.4 In addition, analysts must be aware of the biological hazards associated with blood and other body fluids and take extra precautions to protect themselves.

10.4 Reading and Practical Exercises

10.4.1 Complete Module 8 Reading List

_____	_____	_____
Trainee	Trainer	Date

10.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

10.4.3 Practical Exercise II – locate and read Safety Data Sheet – Amido Black and carrier solvents.

_____	_____	_____
Trainee	Trainer	Date

10.4.4 Practical Exercise III – Trainer led lesson on the mixing of Amido Black.

_____	_____	_____
Trainee	Trainer	Date

10.4.5 Practical Exercise IV – Trainer led demonstration on the application and preservation of Amido Black followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

10.5 Written Test – Module 8

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

11.0 Module 9: Processing Technique – 1, 8-Diazafluoren-9-One (DFO), 1, 2 – Indanedione, and 1, 2 Indanedione TP

11.1 Background and Theory

1, 8-Diazafluoren-9-one (DFO) was originally prepared in 1950, but its reaction with amino acids was not explored until 1990, when it was first used as a fingerprint development reagent. It was observed that the application of DFO resulted in pink fingerprints that fluoresced. Fluorescence occurs when energy is supplied by an external source (in this case, an ALS) and is absorbed by a fluorescent chemical, creating an excited electronic state. In an effort to return to its ground state, the chemical emits energy that can be visualized as fluorescence. DFO fluoresces when illuminated between 450nm-570nm. The reagent is now widely used to develop friction ridge impressions composed of amino acids on porous surfaces.

The fingerprint developing qualities of 1, 2-Indanedione were first reviewed after a related compound, (6-methyl-thio-1, 2-indanedione) was found to produce fluorescent fingerprints. 1, 2-Indanedione was found to produce fingerprints similar to DFO. Prints treated with this chemical fluoresce when exposed to wavelengths of 450-570nm. As with DFO, 1, 2-Indanedione reacts with the amino acids present in fingerprints and is utilized on porous surfaces.

Special formulations of 1, 2-Indanedione have been created that allow for use on thermal papers. These formulations do not utilize an external heat source, decreasing the darkening of the substrate.

11.2 Objectives, Principles, and Knowledge

11.2.1 Basic knowledge of the chemicals, the latent print matrices with which they react, potential safety hazards, and appropriate substrates for use.

11.2.2 Demonstrate proper chemical application and preservation of developed prints.

11.2.3 Demonstrate proper mixing, use of controls, documentation, storage, and disposal.

11.3 Health and Safety Hazards

11.3.1 DFO has not been fully investigated for potential health hazards, but is thought to be similar to ninhydrin, which may act as an irritant. Gloves, lab coats, and safety glasses should be worn when mixing and using DFO. The application of the DFO working solution should be performed in a fume hood, well-ventilated

area, or while wearing an air-purifying respirator equipped with an organic vapor cartridge.

11.3.2 Glacial acetic acid is *corrosive* and extremely irritating to the eyes and respiratory system. Avoid breathing the vapors and use in a fume hood or with adequate ventilation. Glacial acetic acid will cause burns if it comes in contact with skin.

11.3.3 Methanol needs to be handled carefully with gloves during mixing and use. Methanol is toxic in quantities as small as 30 ml and should not be allowed to come in contact with the skin, eyes, or mouth. It is possible for methanol to be absorbed through the skin. If methanol comes into contact with the eyes or mouth, the area should be flushed with generous amounts of water and a doctor may be consulted. Inhalation of methanol vapors should be kept at a minimum.

11.3.4 1,2 Indanedione may be harmful by: inhalation, ingestion and skin absorption. May cause skin and eye irritation.

11.3.5 Ethyl Acetate is hazardous by ingestion or inhalation and slightly hazardous in case of contact with skin or eyes. The substance is toxic to mucous membranes and the upper respiratory tract. Repeated or prolonged exposure to the substance can produce blood, kidneys, liver, or the central nervous system (CNS) damage.

11.3.6 HFE-7100 may be harmful if inhaled, swallowed or absorbed through skin. May cause skin, eye, and respiratory tract irritation. HFE-7100 is not considered a Hazardous chemical as defined by the OSHA Hazard Communication Standard, 29 CFR1910.1200.

11.3.7 Zinc chloride is hazardous. Avoid contact with skin and eyes. It is a known irritant, a permeator and is corrosive. It is classified as a possible human mutagen.

11.3.8 Dichloromethane (Methylene Chloride) is hazardous. Avoid contact with skin and eyes. It is a known irritant, permeator and corrosive. Inflammation of the eye is characterized by redness, watering, and itching. It is classified as a possible human carcinogen.

11.4 Reading and Practical Exercises

11.4.1 Complete Module 9 Reading List

_____ _____ _____
Trainee Trainer Date

11.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

11.4.3 Practical Exercise II – locate and read Safety Data Sheets – DFO, 1, 2 – Indanedione, 1,2 Indanedione Thermal Paper (TP) and carrier solvents.

_____ _____ _____
Trainee Trainer Date

11.4.4 Practical Exercise III – Trainer led lesson on the mixing of DFO.

_____ _____ _____
Trainee Trainer Date

11.4.5 Practical Exercise IV – Trainer led lesson on the mixing of 1, 2 – Indanedione.

_____ _____ _____
Trainee Trainer Date

11.4.6 Practical Exercise V – Trainer led lesson on the mixing of 1, 2 Indanedione TP (Thermal Paper).

_____ _____ _____
Trainee Trainer Date

11.4.7 Practical Exercise VI – Trainer led demonstration on the application and preservation of DFO followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

11.4.8 Practical Exercise VII – Trainer led demonstration on the application and preservation of 1, 2 – Indanedione followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

11.4.9 Practical Exercise VIII – Trainer led demonstration on the application and preservation of 1, 2 Indanedione TP (Thermal Paper) developed latent prints followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

11.5 Written Test – Module 9

_____ _____ _____ _____
Trainee Trainer Date Grade

12.0 Module 10: Processing Technique – Dye Stains – Rhodamine 6G and RAM

12.1 Background and Theory

Dye stains are chemicals that are used to help visualize or enhance latent prints developed with other methods. They do not develop prints on their own and are generally applied to non-porous surfaces after fuming with cyanoacrylate ester.

Rhodamine 6G is an extremely efficient and highly fluorescent dye stain. Rhodamine must be visualized using an alternate light source and fluoresces between 450nm and 525nm.

RAM is a dye stain consisting of Rhodamine 6G, Ardrox and MBD (7-(P-Methoxybenzlamino-4Notrobenz-2-Oxa-1, 3-Diazile). This combination allows the stain to fluoresce across a broad spectrum of wavelengths. Since it can be observed under various wavelengths, problematic backgrounds can be tuned out by using a wavelength that only fluoresces the friction ridge impression and not the background. As with rhodamine 6G, the print needs to have been previously developed by cyanoacrylate fuming before using the RAM stain.

12.2 Objectives, Principles, and Knowledge

12.2.1 Basic knowledge of the chemicals, the latent print matrices with which they react, potential safety hazards, and appropriate substrates for use.

12.2.2 Demonstrate proper chemical application and preservation of developed prints.

12.2.3 Demonstrate proper mixing, use of controls, documentation, storage, and disposal.

12.3 Health and Safety Hazards

12.3.1 Rhodamine 6G, Ardrox P133D and MBD are classified as suspected animal carcinogens, but sufficient evidence of human carcinogenicity has not been established. Rhodamine 6G and RAM are thought to be relatively safe when exposure is at low levels. They should never be inhaled or allowed to get into the eyes or mouth, as they are irritants. If this should occur, the eyes or mouth should be flushed with a generous amount of water and a doctor may be consulted.

12.3.2 Methanol, isopropanol, and petroleum ether are highly *flammable*. All three chemicals need to be handled carefully with gloves during mixing and use of the stain. Methanol and isopropanol are toxic in quantities as small as 30 ml and should not be allowed to come in contact with the skin, eyes or mouth. It

is possible for methanol and isopropanol to be absorbed through the skin. If methanol, isopropanol or petroleum ether come into contact with the eyes or the mouth, the area should be flushed with generous amounts of water and a doctor may be consulted. Inhalation of vapors should be kept at a minimum and the stain should be used in a fume hood or a well-ventilated area.

12.3.3 Eye protection, a lab coat, and gloves should be worn. All mixing and application of chemicals should be done inside a ventilated laboratory fume hood. Excess reagent shall be collected and placed in the hazardous waste container located in the fume hood.

12.3.4 Acetonitrile may be fatal if swallowed, inhaled or absorbed through skin. It affects cardiovascular system, central nervous system, liver and kidneys and may cause irritation to skin, eyes and respiratory tract. It is also a flammable liquid and vapor.

12.4 Reading and Practical Exercises

12.4.1 Complete Module 10 Reading List

_____	_____	_____
Trainee	Trainer	Date

12.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

12.4.3 Practical Exercise II – locate and read Safety Data Sheet – Rhodamine 6G, Ardrox, MBD and carrier solvents.

_____	_____	_____
Trainee	Trainer	Date

12.4.4 Practical Exercise III – Trainer led lesson on the mixing of Rhodamine 6G (methanol base).

_____	_____	_____
Trainee	Trainer	Date

12.4.5 Practical Exercise IV – Trainer led lesson on the mixing of Rhodamine 6G (water base).

_____	_____	_____
Trainee	Trainer	Date

12.4.6 Practical Exercise V – Trainer led lesson on the mixing of RAM.

_____	_____	_____
Trainee	Trainer	Date

12.4.7 Practical Exercise VI – Trainer led demonstration on the application and preservation of dye stains followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____	_____	_____	
Trainee	Trainer	Date	

12.5 Written Test – Module 10

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

13.0 Module 11: Processing Technique – Gentian Violet/Crystal Violet

13.1 Background and Theory

Gentian Violet or Crystal Violet is a biological stain used to dye epithelial cells and fatty components of latent print residues an intense purple color. This reagent is a toxic carcinogen and should only be used in small quantities. It can be used on the sticky side of tape (duct tape, clear plastic tape, packaging tape, black electrical tape) and items that are greasy or oily, to enhance prints.

13.2 Objectives, Principles, and Knowledge

13.2.1 Basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

13.2.2 Demonstrate proper chemical application and preservation of developed prints.

13.2.3 Demonstrate proper mixing, use of controls, documentation, storage, and disposal.

13.3 Health and Safety Hazards

13.3.1 Gentian Violet/Crystal Violet is a suspected human carcinogen. It is known to affect the kidney, ureter, bladder, and thyroid of animals. It can be harmful if inhaled and is irritating to the eyes and skin.

13.3.2 Gentian Violet should not be used in large amounts.

13.3.3 A dust mask or respirator with dust filter should be used when working with the dry form. Gentian Violet should be prepared and used in a fume hood or well-ventilated area. The analyst should wear a lab coat, heavy-duty (non-disposable) gloves and safety glasses.

13.4 Reading and Practical Exercises

13.4.1 Complete Module 11 Reading List

_____	_____	_____
Trainee	Trainer	Date

13.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

13.4.3 Practical Exercise II – locate and read Safety Data Sheet – Gentian Violet.

_____	_____	_____
Trainee	Trainer	Date

13.4.4 Practical Exercise III – Trainer led lesson on the mixing of Gentian Violet.

_____	_____	_____
Trainee	Trainer	Date

13.4.5 Practical Exercise IV – Trainer led demonstration on the application and preservation of Gentian Violet followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

13.5 Written Test – Module 11

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

14.0 Module 12: Processing Technique – Iodine

14.1 Background and Theory

Iodine fuming is one of the oldest latent print methods still used today. It was advocated by Pierre Aubert in Paris in 1876. Iodine fuming exposes the evidentiary item to iodine fumes to develop latent prints. Iodine sublimates at low temperatures and the vapors are absorbed by the fats and oils in the latent print to turn it a yellow/brown color. Due to the sublimation of the iodine crystals, the print does not remain the yellow/brown color for very long. It is essential to photograph the print as quickly as possible after it is developed. It is considered a non-destructive technique.

14.2 Objectives, Principles, and Knowledge

14.2.1 Basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

14.2.2 Demonstrate proper chemical application and preservation of developed prints.

14.2.3 Demonstrate proper use of controls, documentation, storage, and disposal.

14.3 Health and Safety Hazards

14.3.1 Safety is a serious concern when using the iodine fuming method. Iodine is toxic in any form. ALWAYS AVOID INHALING IODINE FUMES.

14.3.2 Iodine fumes may irritate the skin and damage the respiratory tract. Headaches that can last for several days may result from exposure to iodine. Long-term effects to the thyroid gland may result from exposure.

14.3.3 Adequate ventilation when using the method is mandatory as the fumes are corrosive to metals and may discolor other surfaces that they come in contact with.

14.3.4 Iodine shall be purchased in glass ampoules. The ampoules shall stay sealed until use.

14.4 Reading and Practical Exercises

14.4.1 Complete Module 12 Reading List

_____	_____	_____
Trainee	Trainer	Date

14.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____

Trainee Trainer Date

14.4.3 Practical Exercise II – locate and read Safety Data Sheet – Iodine.

_____ _____ _____
Trainee Trainer Date

14.4.4 Practical Exercise III – Trainer led demonstration on the application and preservation of Iodine followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

14.5 Written Test – Module 12

_____ _____ _____ _____
Trainee Trainer Date Grade

15.0 Module 13: Processing Technique – Leuco Crystal Violet (LCV)

15.1 Background and Theory

Leuco Crystal Violet (LCV) is a biological stain that reacts to the heme group in blood to cause the impression residues to turn an intense purple color. It should only be applied to thoroughly dried blood impressions. LCV gives an almost instantaneous visualization of latent prints in existing ambient light. Resulting prints should be photographed as soon as possible to avoid over development of the background.

15.2 Objectives, Principles, and Knowledge

15.2.1 Basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

15.2.2 Demonstrate proper chemical application and preservation of developed prints.

15.2.3 Demonstrate proper mixing, use of controls, documentation, storage, and disposal.

15.3 Health and Safety Hazards

15.3.1 Leuco Crystal Violet may be harmful by inhalation, ingestion or skin adsorption; may cause skin and eye irritation; may cause irritation to mucous membranes and upper respiratory tract.

15.3.2 Leuco Crystal Violet should not be used in large amounts.

15.3.3 A respirator should be used when working with the dry form. Leuco Crystal Violet should be prepared and used in a fume hood or well-ventilated area. The analyst should wear a lab coat, gloves and safety glasses.

15.3.4 In addition, analysts must be aware of the biological hazards associated with blood and other body fluids and take extra precautions to protect themselves.

15.4 Reading and Practical Exercises

15.4.1 Complete Module 13 Reading List

_____	_____	_____
Trainee	Trainer	Date

15.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

15.4.3 Practical Exercise II – locate and read Safety Data Sheet – Leuco Crystal Violet and carrier solvents.

_____ _____ _____
Trainee Trainer Date

15.4.4 Practical Exercise III – Trainer led lesson on the mixing of Leuco Crystal Violet.

_____ _____ _____
Trainee Trainer Date

15.4.5 Practical Exercise IV – Trainer led demonstration on the application and preservation of Leuco Crystal Violet followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

15.5 Written Test – Module 13

_____ _____ _____ _____
Trainee Trainer Date Grade

16.0 Module 14: Processing Technique – Ninhydrin and ThermaNin

16.1 Background and Theory

Ninhydrin (triketohydrindene hydrate) was first used in 1910 when Siegfried Ruhemann mistakenly prepared the compound. Ruhemann observed that the new compound reacted with amino acids to produce an intense purple color. Following Ruhemann's discovery, ninhydrin's use spread to analytical chemistry and biochemical applications. As early as 1916, the reaction with amino acids was used as an important test for the presence of protein in biological samples.

The technique is now one of the most popular methods for friction ridge detection on paper and other porous surfaces. The combination of heat and humidity accelerates the reaction of the proteins and amino acids with the ninhydrin.

Special formulations have been created that allow for use on thermal papers. These formulations do not utilize an external heat/humidity source, decreasing the darkening of the substrate.

16.2 Objectives, Principles, and Knowledge

16.2.1 Basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

16.2.2 Demonstrate proper chemical application and preservation of developed prints.

16.2.3 Demonstrate proper mixing, use of controls, documentation, storage, and disposal.

16.3 Health and Safety Hazards

16.3.1 Gloves, lab coat, and eye protection shall be worn when using or mixing ninhydrin or ThermaNin. Precautions should also be taken to avoid inhalation of the fumes.

16.3.2 Hexane, is *extremely flammable* and the solution is to be used or mixed in a fume hood or in another well-ventilated area. Ensure that ninhydrin treated items are completely dry prior to exposing to the heat source.

16.3.3 Glacial acetic acid is *corrosive* and extremely irritating to the eyes and respiratory system. Avoid breathing the vapors and use in a fume hood or with adequate ventilation. Glacial acetic acid will cause burns if it comes in contact with skin.

16.3.4 2-Propanol, also known as Isopropyl Alcohol, is *flammable.* It is an irritant and can be harmful if inhaled. Avoid breathing the vapors and use in a fume hood or with adequate ventilation.

16.3.5 ThermaNin is combustible. It forms explosive mixtures with air on intense heating in dry form. In event of a fire, ThermaNin will develop hazardous combustion gases or vapors.

16.3.6 Ethyl Acetate is hazardous if ingested or inhaled and slightly hazardous in case of contact with skin or eyes. The substance is toxic to mucous membranes and the upper respiratory tract. Repeated or prolonged exposure to the substance can damage the blood, kidneys, liver, or central nervous system (CNS).

16.3.7 HFE-7100 may be harmful if inhaled, swallowed or absorbed through skin. May cause skin, eye, and respiratory tract irritation. HFE-7100 is not considered a Hazardous chemical as defined by the OSHA Hazard Communication Standard, 29 CFR1910.1200.

16.4 Reading and Practical Exercises

16.4.1 Complete Module 14 Reading List

_____ _____ _____
Trainee Trainer Date

16.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

16.4.3 Practical Exercise II – locate and read Safety Data Sheet – Ninhydrin, ThermaNin, and carrier solvents.

_____ _____ _____
Trainee Trainer Date

16.4.4 Practical Exercise III – Trainer led lesson on the mixing of Ninhydrin stock and working solutions.

_____ _____ _____
Trainee Trainer Date

16.4.5 Practical Exercise IV – Trainer led lesson on the mixing of ThermaNin.

_____ _____ _____
Trainee Trainer Date

16.4.6 Practical Exercise V – Trainer led demonstration on the application and preservation of Ninhydrin followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

16.4.7 Practical Exercise VI – Trainer led demonstration on the application and preservation of ThermaNin developed latent prints followed by hands-on processing/preservation by the Trainee, utilizing training samples. The

trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

16.5 Written Test – Module 14

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

17.0 Module 15: Processing Technique – Powder Development of Latent Prints

17.1 Background and Theory

The development of latent prints using powder involves the application of fine particles that physically adhere to the aqueous or oily components in latent print residue. Powder is one of the most common methods of latent print development utilized on non-porous and some semi-porous surfaces. It is also one of the oldest dating back to 1891. At that time, available substances including charcoal, lead powder, soot, and cigar ashes, were used for latent print development.

Most commercial powders use two essential elements to provide adhesion to latent print residue: pigment and binder. The pigment in the powder provides effective visualization, giving contrast against the background surface. The binder provides for maximum and preferential adhesion to latent print residue. There are many different kinds of powders including, black powder, magnetic powder, white powder, fluorescent powder, and various colored powders. No powder is universally applicable to all types of evidence.

There are several different types and sizes of brushes that can be used when applying fingerprint powders. Types include fiberglass, feather and animal hairbrushes as well as magnetic wands. Certain types of brushes are used in conjunction with certain types of powders.

17.2 Objectives, Principles, and Knowledge

17.2.1 Understand the basic types of powders and brushes.

17.2.2 Knowledge of surfaces and environmental factors determining brush type, powder type, and color selection.

17.2.3 Understand the proper procedures for using different types of hair, fiberglass, and magnetic brushes.

17.2.4 Knowledge of equipment maintenance and safety procedures relative to powder development of latent prints.

17.2.5 Knowledge of lifting tape, gel lifters, hinge lifters, etc.

17.3 Health and Safety Hazards

17.3.1 Analysts are required to use the hoods or exhaust vents positioned at each workstation when performing powdering and lifting in the laboratory.

17.3.2 When fingerprint powders are to be used for an extended period of time, a dust mask or half face respirator with dust filters should be worn to minimize the inhalation of the powder particles.

17.3.3 Persons using fingerprint powders should monitor reactions (if any) to the fingerprint powders.

17.4 Reading and Practical Exercises

17.4.1 Complete Module 15 Reading List

_____	_____	_____
Trainee	Trainer	Date

17.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

17.4.3 Practical Exercise II – Trainer led orientation on powder processing to include standard, magnetic, bi-chromatic, and fluorescent powders.

_____	_____	_____
Trainee	Trainer	Date

17.4.4 Practical Exercise III – Trainer led orientation on lifting techniques to include various tapes (clear, frosted, & 3-M), casting mediums (Mikrosil & Accutrans), and lifts (gel & hinge).

_____	_____	_____
Trainee	Trainer	Date

17.4.5 Practical Exercise IV – hands-on powder and lifting exercises by the Trainee utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

17.5 Written Test – Module 15

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

18.0 Module 16: Processing Technique – Physical Developer (PD)

18.1 Background and Theory

Physical developer is a technique to detect friction ridge impressions on wet or dry porous items, including papers, tapes, and cardboard. The process involves an oxidation–reduction (redox) reaction whereby a solution of an iron salt reduces aqueous silver nitrate to finely divided metallic silver. The technique derives its name from the photographic developer used during film processing that undergoes a similar redox reaction. The physical developer develops the impressions as dark gray or black due to the adhesion of metallic silver particles on the fatty acid and lipid components of sweat residue. Prior to the introduction of physical developer in the 1970s, there was no reliable method for recovering prints from water-soaked documents.

18.2 Objectives, Principles, and Knowledge

18.2.1 Basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

18.2.2 Demonstrate proper chemical application and preservation of developed prints.

18.2.3 Demonstrate proper mixing, documentation, storage, and disposal.

18.3 Health and Safety Hazards

18.3.1 Physical developer should only be used in a fume hood or well-ventilated area, as it is irritating to the respiratory tract.

18.3.2 Lab coats, gloves and safety glasses should be worn.

18.3.3 Standard laboratory protocol is followed for chemical handling.

18.4 Reading and Practical Exercises

18.4.1 Complete Module 16 Reading List

_____	_____	_____
Trainee	Trainer	Date

18.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

18.4.3 Practical Exercise II – locate and read Safety Data Sheet for physical developer and maleic acid.

_____	_____	_____
Trainee	Trainer	Date

18.4.4 Practical Exercise III – Trainer led lesson on the mixing of PD and Maleic Acid Prewash.

_____	_____	_____
Trainee	Trainer	Date

18.4.5 Practical Exercise IV – Trainer led demonstration on the application and preservation of PD followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

18.5 Written Test – Module 16

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

19.0 Module 17: Processing Technique – RECOVER LFT

19.1 Background and Theory

RECOVER LFT is a technique that has been validated to detect friction ridge impressions on copper-based/brass items. The process involves converting tetrasulfur tetranitride (S_4N_4) to disulfur dinitride (S_2N_2) crystals by thermal cracking. The S_2N_2 crystals are then polymerized to form a solid state $(SN)_x$. It is believed that fingerprint residue reacts with the nitride during polymerization of S_2N_2. RECOVER LFT developed friction ridges may present as a blue/black print on lighter background or as a light-colored print with blue/black background discoloration. While the interaction between S_2N_2 and the latent print matrix has yet to be fully explained, disulfur dinitride is an effective treatment on copper-based metal surfaces including those exposed to adverse environments including washing with water and detergents, bleach, and acetone.

19.2 Objectives, Principles, and Knowledge

19.2.1 Basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

19.2.2 Demonstrate proper chemical application and preservation of developed prints.

19.2.3 Demonstrate proper documentation, storage, and disposal.

19.3 Health and Safety Hazards

19.3.1 RECOVER DEVELOP precursor contains copper bromide tetrathiatetrazocine. Heating (in air) may cause a fire. Keep RECOVER DEVELOP precursor out of extreme heat. The precursor may be harmful if contact with skin, eyes, or swallowing occurs.

19.3.2 Respiratory hazards may occur with inadequate or obstructed ventilation. The RECOVER instrument must be operated with in an active fume hood. Caution should be taken to avoid breathing fumes

19.3.3 Thermal hazards may occur with inadequate or obstructed ventilation. Caution should be taken to avoid contact with hot surfaces.

19.3.4 Lab coats, gloves and safety glasses should be worn.

19.4 Reading and Practical Exercises

19.4.1 Complete Module 17 Reading List

_____	_____	_____
Trainee	Trainer	Date

19.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading

that you feel are particularly notable. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

19.4.3 Practical Exercise II – locate and read Safety Data Sheet for RECOVER DEVLOP precursor

_____ _____ _____
Trainee Trainer Date

19.4.4 Practical Exercise III - Trainer led demonstration on the application and preservation of RECOVER LFT followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

19.5 Written Test – Module 17

_____ _____ _____ _____
Trainee Trainer Date Grade

20.0 Module 18: Processing Technique – Small Particle Reagent (SPR)

20.1 Background & Theory

Small particle reagent (SPR) is a technique used to develop latent friction ridge impressions on moist, non-porous surfaces. Two types of SPR are available: the conventional formula consisting of molybdenum (IV) disulfide and commercially available white SPR. This technique relies on the adherence of fine particles, within a suspension solution, to the fatty components of latent print residue. This is the same approach as fingerprint powder. This technique was originally discovered by J.R. Morris in 1981.

20.2 Objectives, Principles, and Knowledge

20.2.1 Basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

20.2.2 Demonstrate proper chemical application and preservation of developed prints.

20.2.3 Demonstrate proper mixing, use of controls, documentation, storage, and disposal.

20.3 Health and Safety Hazards

20.3.1 There does not appear to be any health hazards associated with small particle reagent, but the process should be monitored to see if there are any allergies.

20.3.2 Lab coats, gloves and safety glasses should be worn.

20.3.3 Standard laboratory protocol is followed for chemical handling.

20.4 Reading and Practical Exercises

20.4.1 Complete Module 18 Reading List

_____ _____ _____
Trainee Trainer Date

20.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

20.4.3 Practical Exercise II – locate and read Safety Data Sheet - traditional and white SPR.

_____ _____ _____
Trainee Trainer Date

20.4.4 Practical Exercise III – Trainer led lesson on the mixing of traditional SPR.

_____ _____ _____

Trainee Trainer Date

20.4.5 Practical Exercise IV – Trainer led demonstration on the application and preservation of traditional SPR followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

20.4.6 Practical Exercise V – Trainer led demonstration on the application and preservation of white SPR followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

20.5 Written Test – Module 18

_____ _____ _____ _____
Trainee Trainer Date Grade

21.0 Module 19: Processing Technique – Sticky Side Powder/Sticky Side Powder Equivalent

21.1 Background and Theory

Sticky-side powder is a liquid fingerprint powder method that develops latent prints on adhesive surfaces. Sticky-side powder detects epithelial cells and fatty/oily components of latent print residue left when handling adhesive surfaces. Sticky side powder can be used on almost any tape but works especially well on duct and electrical tape. Sticky side powder was developed in the mid-1990's when researchers at the National Identification Centre, Tokyo Metropolitan Police, were investigating methods for developing latent impressions on the adhesive side of tapes.

21.2 Objectives, Principles, and Knowledge

21.2.1 Basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

21.2.2 Demonstrate proper chemical application and preservation of developed prints.

21.2.3 Demonstrate proper mixing, use of controls, documentation, storage, and disposal.

21.3 Health and Safety Hazards

21.3.1 When using the powder in the dry form, precautions should be taken to prevent the powder from becoming airborne and possibly inhaled.

21.3.2 Lab coats, gloves, and safety glasses should be worn.

21.3.3 Standard laboratory protocol is followed for chemical handling.

21.4 Reading and Practical Exercises

21.4.1 Complete Module 19 Reading List

_____ _____ _____
Trainee Trainer Date

21.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

21.4.3 Practical Exercise II – locate and read Safety Data Sheet – Sticky Side Powder.

_____ _____ _____
Trainee Trainer Date

21.4.4 Practical Exercise III – Trainer led lesson on the mixing of Sticky Side Powder.

_____ _____ _____

Trainee Trainer Date

21.4.5 Practical Exercise IV – Trainer led demonstration on the application and preservation of Sticky Side Powder followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____ _____ _____

Trainee Trainer Date

21.5 Written Test – Module 19

_____ _____ _____ _____

Trainee Trainer Date Grade

22.0 Module 20: Processing Technique – Sudan Black

22.1 Background and Theory

Sudan Black was originally used in laboratories for biological testing or chemical screening for fatty components. Sudan black was initially reported to detect the oily/fatty components of fingerprint residue by Misui, Katho, Shimada, and Wakasugi of the Criminal Science Laboratory in Nagoya-shi, Japan in 1980. It is a dye stain that produces a blue-black product and is used to develop latent friction ridge impressions on non-porous waxy substrates and surfaces contaminated with grease, dried beverages, and food residue. Sudan black will also enhance latent impressions developed by cyanoacrylate fuming.

22.2 Objectives, Principles, and Knowledge

22.2.1 Basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

22.2.2 Demonstrate proper chemical application and preservation of developed prints.

22.2.3 Demonstrate proper mixing, use of controls, documentation, storage, and disposal.

22.3 Health and Safety Hazards

22.3.1 The Sudan Black working solution contains methanol. Methanol is toxic in quantities as small as 30 ml and should not be allowed to come in contact with the skin, eyes or mouth. It is possible for methanol to be absorbed through the skin. If methanol comes into contact with the eyes or mouth, the area should be flushed with generous amounts of water and a doctor may be consulted. Inhalation of methanol vapors should be kept at minimum.

22.3.2 Sudan Black should be used in a fume hood or well-ventilated area.

22.3.3 Lab coats, gloves and safety glasses should be worn.

22.3.4 Standard laboratory protocol is followed for chemical handling.

22.4 Reading and Practical Exercises

22.4.1 Complete Module 20 Reading List

_____ _____ _____
Trainee Trainer Date

22.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

22.4.3 Practical Exercise II – locate and read Safety Data Sheet – Sudan Black and carrier solvents.

_____	_____	_____
Trainee	Trainer	Date

22.4.4 Practical Exercise III – Trainer led lesson on the mixing of Sudan Black.

_____	_____	_____
Trainee	Trainer	Date

22.4.5 Practical Exercise IV – Trainer led demonstration on the application and preservation of Sudan Black followed by hands-on processing/preservation by the Trainee, utilizing training samples. The trainee will be able to explain to the trainer the process, what it may be reacting with, and where it is generally utilized in a processing sequence. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

22.5 Written Test – Module 20

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

23.0 Module 21: Processing Technique – Cyanoacrylate Ester (Super Glue®)

23.1 Background and Theory

Cyanoacrylate ester (CAE), also known as "Super Glue®", is a technique used to develop latent friction ridge impressions on virtually all non-porous and some semi-porous surfaces, including glass, metal, coated papers, and all forms of plastics. This method is especially effective on rough or textured surfaces. CAE processing also prepares the evidence for the acceptance of powder and dye-stains that may enable further visualization of the latent prints. Super Glue® was created in the 1950's by researchers who were trying to develop an acrylic polymer for the aircraft industry. In the late 1970's, researchers discovered its latent fingerprint development use, using the fumes of the glue. Shortly thereafter, the Bureau of Alcohol, Tobacco, and Firearms introduced this technique to North America and it quickly gained acceptance worldwide.

CAE fuming works by quickly bonding the CAE monomers to the latent print residues. The monomer on the fingerprint residue reacts with another CAE monomer in the vapor phase to form a dimer on the print. This reacts with another monomer to eventually form a polymer of CAE molecules. The overall development time is fast, especially when volatilization of the glue is accelerated (via heating or pretreatment).

23.2 Objectives, Principles, and Knowledge

23.2.1 Basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

23.2.2 Demonstrate ability to properly utilize the CAE fuming chambers, wands, and vacuum chambers.

23.2.3 Demonstrate proper preservation of developed prints.

23.2.4 Demonstrate proper use of controls, documentation, storage, and disposal.

23.3 Health and Safety Hazards

23.3.1 CAE fuming should only be conducted in a filtered chamber or well-ventilated area. Precautions should be taken to avoid inhaling or allowing the vapors to contact the eyes, as the vapors can be irritating to the eyes, nose, and throat. Persons wearing contact lenses should not open CAE chambers without proper precautions. Non-vented goggles should be worn.

23.3.2 Precautions include properly sealed CAE chambers and evacuating the fumes from the chambers prior to removal of the questioned and test surfaces.

23.3.3 Gloves should be worn to prevent the cyanoacrylate from contacting the skin. If liquid glue is allowed to contact the skin, adhesion may result. If the skin sticks together, immerse affected areas in warm water. This will loosen the skin so that it can be gently pulled apart.

23.4 Reading and Practical Exercises

23.4.1 Complete Module 21 Reading List

_____	_____	_____
Trainee	Trainer	Date

23.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

23.4.3 Practical Exercise II – locate and read Safety Data Sheet – CAE.

_____	_____	_____
Trainee	Trainer	Date

23.4.4 Practical Exercise III – Trainer led demonstration on the application of CAE using the fuming chambers followed by hands-on processing by the Trainee, utilizing training samples. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

23.4.5 Practical Exercise IV – Trainer led demonstration on the application of CAE using the fuming wand followed by hands-on processing by the Trainee, utilizing training samples. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

23.4.6 Practical Exercise V – Trainer led demonstration on the application of CAE using the vacuum chambers followed by hands-on processing by the Trainee, utilizing training samples. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

23.4.7 Practical Exercise VI – Demonstrate to the Trainer your ability to preserve CAE developed prints. The trainee will be able to explain to the trainer the process, what it may be reacting with, and when it may be more or less advantageous to use the fuming chamber, fuming wand, or vacuum chamber. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

23.5 Written Test – Module 21

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

24.0 Module 22: Digital Imaging

24.1 Background and Theory

Latent print images are frequently captured, processed and stored using digital devices. All of the techniques used in digital image processing have their roots in traditional photography and mathematics. The use of digital image processing can yield information not readily apparent in the original image and can assist in drawing a conclusion that might not have been reached otherwise. Image processing provides for higher image clarity and contrast.

24.2 Objectives, Principles, and Knowledge

24.2.1 Understand the capabilities and limitations of specific technologies that relate to digital imaging and storage of latent and inked prints.

24.2.2 Understand digital processing techniques using Adobe Photoshop to improve the visualization of latent print images.

24.2.3 Proficiency in the use of processing techniques to include, but not limited to: color reversal, position reversal, layers, contrast, image calibration/resolution, digital filters, and creation of enlargements.

24.2.4 Proficiency in the use of the current digital imaging system.

24.3 Health and Safety Hazards

24.3.1 As with other electrical appliances, guard against electrical shock. This can be accomplished by ensuring that all connections are proper and that no loose, damaged, or frayed wires exist.

24.4 Reading and Practical Exercises

24.4.1 Complete Module 22 Reading List

_____	_____	_____
Trainee	Trainer	Date

24.4.2 The Trainee should attend a Digital Imaging course. (20 hour minimum - attach copy of certificate).

_____	_____	_____
Trainee	Trainer	Date

24.4.3 Practical Exercise I – Trainer led lesson on digital image processing to include a demonstration of commonly utilized techniques. The Trainee shall practice processing techniques on the training images. Processed images will be evaluated by the Trainer and the Trainee will discuss with the Trainer the reasons they chose specific techniques. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

24.4.4 Practical Exercise II– continue adding to the game or other activity you developed in Module 1. Incorporate at least three of the terms located in the Objectives, Principles, and Knowledge Section above as well as any others from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

24.4.5 Digital Imaging Competency Test: Trainee will independently capture, calibrate, process, and document, within the digital imaging system, ten latent prints as assigned by the Trainer. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

24.5 Written Test – Module 22

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

25.0 Module 23: Biology and Physiology of Friction Ridge Skin

25.1 Background and Theory

A thorough understanding of the anatomy and physiology of friction ridge skin allows examiners to correctly analyze latent print impressions. Elements of biology and physiology explain why friction ridge skin is unique, why features of the skin persist, how the features of the skin age, how the skin responds to injury and why scars that form are unique. Understanding the pliability of friction ridge skin and how the skin reacts when it contacts a surface also provides valuable assistance during the examination of friction ridge impressions.

25.2 Objectives, Principles, and Knowledge

25.2.1 Understand the biology and physiology of friction ridge skin.

25.2.2 Understand the basic foundations of the science of friction ridge identification (persistence and discriminability).

25.2.3 Understand the basic anatomy and terminology of the hands and feet.

25.2.4 Understand the general chemical composition of human perspiration as a means of understanding the composition of latent print residue.

25.2.5 Knowledge of genetic abnormalities of friction ridge skin (e.g. dysplasia, dissociated ridges).

25.2.6 Knowledge of alteration and mutilation of friction ridge skin.

25.3 Health and Safety Hazards

25.3.1 N/A

25.4 Reading and Practical Exercises

25.4.1 Complete Module 23 Reading List

_____	_____	_____
Trainee	Trainer	Date

25.4.2 Practical Exercise I– continue adding to the game or other activity you developed in Module 1. Incorporate at least one question for each line of the Objectives, Principles, and Knowledge Section above as well as any others from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

25.4.3 Practical Exercise II – Find and read two articles (published within the past 10 years) on the biology and physiology of friction ridge skin. Present a synopsis of the papers to the latent print section. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

25.5 Written Test – Module 23

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

26.0 Module 24: Recording Inked Fingerprints, Palm Prints, and Footprints

26.1 Background and Theory

Recording inked fingerprints, palm prints and footprints is necessary for latent print examinations. These impressions can be made using a number of techniques, including traditional ink, Livescan, and powder/adhesive lift methods. Care and determination in recording the prints should always be exercised in order to obtain the best quality recordings for classification and/or comparison.

26.2 Objectives, Principles, and Knowledge

26.2.1 Understand the various methods for recording known friction ridges for criminal history or personal identification including knowledge of chemical (inkless) systems, printer's ink, the black powder/adhesive lift (Handiprint®) method and electronic capture systems (Livescan).

26.2.2 Understand the quality of friction ridge detail produced by each method.

26.2.3 Understand the benefits associated with obtaining victim/elimination prints and complete friction ridge exemplars (major case prints).

26.2.4 Understand the proper method of completing fingerprint and palm print card information, sequence for recording fingers, and method of printing plain impressions.

26.2.5 Demonstrate ability to properly use ink and brayer to record fingerprints, palm prints, and footprints (including equipment maintenance).

26.2.6 Demonstrate ability to properly record complete friction ridge exemplars (major case prints).

26.3 Health and Safety Hazards

26.3.1 N/A

26.4 Reading and Practical Exercises

26.4.1 Complete Module 24 Reading List

_____	_____	_____
Trainee	Trainer	Date

26.4.2 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

26.4.3 Practical Exercise II – Rolling Inked Prints - Instruction by Trainer followed by practice on at least three individuals. Exemplars will be evaluated by and discussed with the Trainer. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

26.4.4 Practical Exercise III – Taking Major Case Prints (include footprints) - Instruction by Trainer followed by hands-on application. Exemplars will be evaluated by and discussed with the Trainer. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

26.4.5 Practical Exercise IV – Black Powder Adhesive Lift Method - Instruction by Trainer followed by hands-on application. Exemplars will be evaluated by and discussed with the Trainer. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

26.4.6 Practical Exercise V – Livescan Terminal Familiarity – Overview led by Livescan terminal operator.

_____	_____	_____
Trainee	Trainer	Date

26.5 Written Test – Module 24

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

27.0 Module 25: Friction Ridge Pattern Recognition and Interpretation

27.1 Background and Theory

Friction ridge identification and classification has a long history rooted in scientific research and empirical observations. Various classification systems including Henry, Vucetich, and National Crime Information Center (NCIC), have been successfully used over the past 100 years. Today's classification systems rely mainly upon computers to digitize, categorize, recall, and identify matching ten-print cards. NCIC became operational in 1967.

While the use of computers has modernized fingerprint classification within the criminal justice system and forensic science, it is important that latent print examiners be able to recognize and articulate the various patterns and sub-patterns, their use in analysis and comparison, as well as the history behind them.

27.2 Objectives, Principles, and Knowledge

27.2.1 Understand common terminology and definitions associated with friction ridge pattern recognition (arch, loop, and whorl).

27.2.2 Know frequency rates for each major fingerprint pattern type and which patterns are most likely to occur on which fingers.

27.2.3 Ability to differentiate between pattern types.

27.2.4 Awareness and understanding of the Henry Classification System to include: origin, FBI extensions, pattern interpretation, & parts of classification.

27.2.5 Awareness and understanding of other classification systems (NCIC Classification System, American System, and the Vucetich System)

27.2.6 Understand friction ridge formations as they relate to recognition, interpretation, and identification.

27.3 Health and Safety Hazards

27.3.1 N/A

27.4 Reading and Practical Exercises

27.4.1 Complete Module 25 Reading List

_____ _____ _____

Trainee Trainer Date

27.4.2 Practical Exercise I – Obtain 5 fingerprints from your trainer. Note to the side of each which fingers you believe these patterns might be most likely to occur on. Where would you search first? Enter the pattern, ridge count, tracing etc. information for these 5 prints into the following website and evaluate your

suppositions. https://demo.hugin.com/example/FingerprintEvidence Pass/Fail.

_____ _____ _____
Trainee Trainer Date

27.4.3 Practical Exercise II – continue adding to the game or other activity you developed in Module 1. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

27.4.4 Practical Exercise III – Fingerprint Classification - Classify three fingerprint cards for both Primary Henry and individual pattern types. Passing score is 80%.

_____ _____ _____
Trainee Trainer Date

27.5 Written Test – Module 25

_____ _____ _____ _____
Trainee Trainer Date Grade

28.0 Module 26: Introduction to Latent Prints and the State of the Science

28.1 Background and Theory

Forensic scientists are entrusted with a great amount of responsibility. The public and the criminal justice system expect that forensic scientists be unbiased, intelligent, and thorough. In order to do so, scientists must take their responsibility seriously and uphold the ethics and values required for their position. Over the past decade, the news has been filled with stories of incompetence and out right misconduct. Crime labs in nearly every state have been affected and, in turn, the field of forensic science is facing more and more challenges. We are seeing them on multiple fronts from both the court system, in the form of Daubert hearings, to legislation requiring accreditation. Many resources are being put into exploring the state of the science and what the path forward should look like. From the 2009 NAS report on Strengthening Forensic Science in the United States to the formation of the Organization of Scientific Area Committees (OSACs), the field is rapidly changing.

28.2 Objectives, Principles, and Knowledge

28.2.1 Knowledge of the professional duties, moral obligations, and code of ethics for Latent Print Examiners.

28.2.2 Knowledge of the various professional organizations and certifications.

28.2.3 Be familiar with the NAS report and the impact it is having on the field.

28.2.4 Be familiar with the Friction Ridge OSAC and its activities.

28.3 Health and Safety Hazards

28.3.1 N/A

28.4 Reading and Practical Exercises

28.4.1 Complete Module 26 Reading List

_____ _____ _____
Trainee Trainer Date

28.4.2 Practical Exercise I– continue adding to the game or other activity you developed in Module 1. Incorporate at least one question for each line of the Objectives, Principles, and Knowledge Section above as well as any others from your reading that you feel are particularly notable. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

28.4.3 Practical Exercise II – "48 matches exercise." Passing score is 100% - exercise will be returned to Trainee until all answers are correct.

_____ _____ _____ _____

Trainee Trainer Date Grade

28.4.4 Practical Exercise III – Locate and read the "Code of Ethics and Standards of Professional Conduct" for latent print examiners as published by the IAI.

_____ _____ _____
Trainee Trainer Date

28.4.5 Practical Exercise IV – Make application to the IAI and/or PNWD-IAI.

_____ _____ _____
Trainee Trainer Date

28.4.6 Practical Exercise V – visit https://www.nist.gov/topics/organization-scientific-area-committees-forensic-science to become familiar with the OSACs. Give a five minute presentation to the latent print section on a topic relevant to them. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

28.5 Written Test – Module 26

_____ _____ _____ _____
Trainee Trainer Date Grade

29.0 Module 27: Human Factors

29.1 Background and Theory

The term "human factors" as it applies to forensic science, is the scientific discipline concerned with the understanding of interactions among humans and other elements of the forensic system including products, decisions, procedures, workspaces, and the overall environment encountered at work. It advances an understanding of the nature of errors in complex work settings and attempts to mitigate them by applying theory, principles, data, and method design to optimize overall performance and improve cognitive abilities with respect to judgment and decision making. Human factors research has its roots in post-World War I aviation psychology and was first applied to forensic science, and latent print examination in particular, in the mid 2000's. By 2008, the National Institute of Justice (NIJ) Office of Investigative and Forensic Sciences (OIFS) and the National Institute of Standards and Technology's (NIST's) Law Enforcement Standards Office (OLES) had put together an Expert Working Group on Human Factors in Latent Print Analysis. The Organization of Scientific Area Committees (OSAC) currently has a Human Factors Committee established to provide advice and guidance on human factors issues in forensics.

29.2 Objectives, Principles, and Knowledge

29.2.1 Develop an understanding of the nature of errors in latent print examination.

29.2.2 Identify the various human factors that lead to errors.

29.2.3 Understand the role of human factors and their contributions to errors in latent print analysis.

29.2.4 Understand how environmental conditions affect the quality of latent print examinations.

29.2.5 Ability to define the different types of bias: cognitive bias, confirmation bias, contextual bias, etc.

29.2.6 Ability to define the different types of errors: false positive, false negative, etc.

29.3 Health and Safety Hazards

29.3.1 N/A

29.4 Reading and Practical Exercises

29.4.1 Complete Module 27 Reading List

_____	_____	_____
Trainee	Trainer	Date

29.4.2 Practical Exercise I– continue adding to the game or other activity you developed in Module 1. Incorporate at least one question for each line of the Objectives, Principles, and Knowledge Section above as well as any others from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

29.5 Written Test – Module 27

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

30.0 Module 28: Analysis, Comparison, Evaluation, and Verification (ACE-V)

30.1 Background and Theory

The scientific method is a method of research in which a problem is identified, relevant data is gathered, and a hypothesis is formulated from the data and then tested. In forensic science, it is imperative to have a scientific technique for examination. Doing so ensures that evidence is treated equally, and conclusions are reliable and unbiased. The latent print section utilizes ACE-V as part of the examination methodology. ACE-V is an acronym that stands for analysis (A), comparison (C), evaluation (E) and verification (V). It is the process that latent print examiners utilize to reach a conclusion about a comparison examination.

Huber initially discussed ACE-V in 1959 when describing the philosophy of science and the correct use of the scientific method. Huber described hypothesis testing as analyzing, comparing, and evaluating and noted that verification was needed. In 1979, David Ashbaugh noted the applicability of the methodology to the latent print comparison process. In 1998, during the first Daubert hearing on fingerprint evidence, the members of the fingerprint community recognized the need to better articulate how they came to their conclusions. ACE-V was determined to be one such way to do so. Today, ACE-V has gained widespread recognition and implementation within the field.

30.2 Objectives, Principles, and Knowledge

30.2.1 Understand the scientific methodology and its application to friction ridge examination.

30.2.2 Understand the individual friction ridge structure (e.g., continuity, texture, pore, and edge definition) for determining the existence of individualizing details.

30.2.3 Understand friction ridge characteristics (dots, ridge endings, and bifurcations), the varying definitions/interpretations assigned to combinations of those three ridge characteristics, and how they may be utilized in effecting identification.

30.2.4 Understand the value of incipient ridge characteristics for use in latent print comparison/identification.

30.2.5 Understand the importance of elimination prints and the utility of completing comparisons of known individuals (e.g. victims) before searching a print in the MBIS system.

30.2.6 Ability to recognize and utilize ridge flow configurations (size, pattern, focal points, etc.), scars, creases, and other friction ridge characteristics.

30.2.7 Ability to recognize, and if possible, determine the area from which the latent fingerprints, palm prints, and foot/toe prints originated.

30.2.8 Understand the nature of color reversals (entire print) and changes (within the same print) and the ability to properly analyze these occurrences when they are encountered in latent print comparisons.

30.2.9 Understand the effects of pressure distortion, slippage, overlays, pre- and post- deposit artifacts (surface scratches, soil, brush strokes, etc.), and the ability to properly analyze such disturbances/distortion.

30.2.10 Understand the different policies and standards that exist regarding what constitutes friction ridge identification in the U.S. and other countries and why no minimum number of ridge characteristics can be defined to effect an identification (i.e., positive opinion based on personal empirical experience in examining and comparing latent prints).

30.2.11 Knowledge of simultaneous or adjacent impressions and their value for identification.

30.2.12 Ability to analyze fragmentized friction ridge detail to determine its value (comparison/identification, value/no value).

30.2.13 Knowledge of various methods used to record known friction ridge impressions and the ability to properly evaluate ridge structure based on each method.

30.2.14 Ability to properly conduct a comparison.

30.2.15 Ability to render an accurate source conclusion (identification, inconclusive, exclusion).

30.2.16 Understand the necessity for verification by another qualified latent print examiner.

30.2.17 Understand the role of quality assurance measures in friction ridge examination.

30.2.18 Awareness of the impacts resulting from an erroneous conclusion.

30.2.19 Awareness of basic statistical models and the potential for their integration into the current friction ridge identification procedures.

30.3 Health and Safety Hazards

30.3.1 N/A

30.4 Reading and Practical Exercises

30.4.1 Complete Module 28 Reading List

_____	_____	_____
Trainee	Trainer	Date

30.4.2 The Trainee should attend an approved Latent Print Comparison Techniques training course (36 hour minimum - attach certificate when completed).

_____	_____	_____
Trainee	Trainer	Date

30.4.3 The Trainee should attend an approved Advanced Ridgeology or Complex Comparison course. (36 hour minimum - attach certificate when completed).

Trainee	Trainer	Date

30.4.4 The Trainee should attend an approved Palm Print training course. (20 hour minimum - attach certificate when completed).

Trainee	Trainer	Date

30.4.5 Practical Exercise I – continue adding to the game or other activity you developed in Module 1. Incorporate at least ten questions from your reading that you feel are particularly notable. Pass/Fail.

Trainee	Trainer	Date

30.4.6 Practical Exercise II – "100 Prints." Trainee will assess 100 prints as to value (insufficient ridge detail "IRD," value for exclusion only, or value for comparison) and finger pattern/area of origin. Passing score is 90% for these two columns.
Additional columns, i.e. finger or hand to search first, level of clarity (1, 2, 3), complexity, shape clues, red flags/distortion, and orientation are to be used by the Trainer to assess analysis skill and additional training needs.

Trainee	Trainer	Date

30.4.7 Practical Exercise III – complete comparison packets 1-10 as assigned by the Trainer. Passing score is 100% - exercises will be returned to the Trainee until all answers are correct.

Trainee	Trainer	Date	Packet #
Trainee	Trainer	Date	Packet #
Trainee	Trainer	Date	Packet #
Trainee	Trainer	Date	Packet #
Trainee	Trainer	Date	Packet #
Trainee	Trainer	Date	Packet #
Trainee	Trainer	Date	Packet #
Trainee	Trainer	Date	Packet #
Trainee	Trainer	Date	Packet #
Trainee	Trainer	Date	Packet #

30.5 Written Test – Module 28

Trainee	Trainer	Date	Grade

30.6 Comparison Competency Test- Trainee will independently analyze and compare a mock case. Prints may consist of palm prints, low minutia prints, distorted prints,

and non-matching prints. This competency test will be entered into ILIMS, and as such, Trainee will need to complete all appropriate documentation and attachments and issue a report.

_____	_____	_____
Trainee	Trainer	Date

30.7 Supervised Cases – Complete 20 Supervised Comparison Cases. Trainee shall record all case numbers, associated stats, and the identity of the supervising analyst.

_____	_____	_____
Trainee	Trainer	Date

31.0 Module 29: Case Management and Reporting for Comparison and/or MBIS

31.1 Background and Theory

Forensic scientists are responsible for documenting the activities, methods, and results of their examinations in the case record. Written case records are recorded contemporaneously in ILIMS. All case documentation should be such that another qualified Latent Print Examiner could read the documentation and replicate the work. MBIS searches are also documented in ILIMS with supporting documentation attached so that they too may be evaluated by another qualified analyst.

31.2 Objectives, Principles, and Knowledge

31.2.1 Knowledge of and the ability to demonstrate proper procedures for maintaining chain of custody (documentation and physical control).

31.2.2 Ability to navigate and query the various databases for location of criminal history records, fingerprint and palm print cards.

31.2.3 Ability to navigate and query ILIMS for latent print comparison and/or MBIS cases.

31.2.4 Ability to demonstrate proper procedures for documentation of comparison casework. Documentation shall be such that another qualified Latent Print Examiner could evaluate what was done and replicate any comparisons.

31.2.5 Knowledge of and the ability to demonstrate proper procedures for reporting latent print comparison and MBIS examination findings in an accurate, concise, and clear manner.

31.3 Health and Safety Hazards

31.3.1 N/A

31.4 Reading and Practical Exercises

31.4.1 Complete Module 29 Reading List

_____	_____	_____
Trainee	Trainer	Date

31.4.2 The Trainee should attend a Basic ILETS course (attach certificate when completed).

_____	_____	_____
Trainee	Trainer	Date

31.4.3 Practical Exercise I – Obtain ILETS login and participate in Trainer led lesson on searching and obtaining known exemplars.

_____	_____	_____
Trainee	Trainer	Date

31.4.4 Practical Exercise II – Writing latent print comparison reports in ILIMS – Trainer led discussion and demonstration.

Trainee	Trainer	Date

31.4.5 Practical Exercise III – Trainee shall independently produce three comparison case reports. Pass/Fail.

Trainee	Trainer	Date

31.4.6 Practical Exercise IV – Technical review training for comparison cases - Trainer led discussion and/or demonstration.

Trainee	Trainer	Date

31.4.7 Practical Exercise V – Trainee shall perform administrative and technical review on a minimum of ten comparison case reports with their Trainer. The Trainer will be the reviewer of record and ultimately responsible for the review on these cases. Pass/Fail.

Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case
Trainee	Trainer	Date	Case

31.4.8 Practical Exercise VI – Technical review training for MBIS cases - Trainer led discussion and/or demonstration.

Trainee	Trainer	Date

31.5 Written Test – Module 29

Trainee	Trainer	Date	Grade

32.0 Module 30: Court Procedures, Related Laws, Expert Testimony, Criminal and Civil Procedures Applicable to Latent Prints

32.1 Background and Theory

One of the most important parts of a forensic scientist's job is ensuring that the evidence that has been processed and evaluated is acceptable to the court system. ISPFS has numerous procedures to help ensure that evidence is handled and processed in an acceptable manner. It is also important to ensure that analysts are properly trained and prepared to testify as an expert witness within the field.

There are a number of important statutes and legal decisions that impact friction ridge testimony and the admission of evidence. It is important for latent print examiners to be familiar with some of the Federal Rules of Evidence, including Rules 701, 702, 703, and Rule 16. Important court cases include People v. Jennings, Frye v. United States, Daubert v. Merrel Dow Pharmaceuticals, US v. Byron Mitchell, US v Llera Plaza, and Mayfield v United States.

32.2 Objectives, Principles, and Knowledge.

- 32.2.1 Understand the role of expert witness testimony.
- 32.2.2 Knowledge of factors regarding the admissibility of evidence.
- 32.2.3 Knowledge of relevant court cases and case histories.
- 32.2.4 Understand the rules of discovery and evidence.
- 32.2.5 Knowledge of applicable legal challenges to admissibility.
- 32.2.6 Understand critical challenges to the discipline.
- 32.2.7 Understand the advantages and disadvantages of different court chart types/methods (points, area bubbles, power point).
- 32.2.8 Select appropriate prints and individual ridge characteristics for charting, create court charts, and utilize the digital imaging system to create court charts/exhibits.
- 32.2.9 Ability to verbally articulate the friction ridge examination process and any resulting conclusions.

32.3 Health and Safety Hazards

- 32.3.1 N/A

32.4 Reading and Practical Exercises

- 32.4.1 Complete ISP FS core training court module

32.4.2 Complete Module 30 Reading List

_____	_____	_____
Trainee	Trainer	Date

32.4.3 The Trainee should attend a court room testimony training class when available (attach copy of certificate).

_____	_____	_____
Trainee	Trainer	Date

32.4.4 Practical Exercise I – Write a three to five page paper on a recent court development as it relates to fingerprints. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

32.4.5 Practical Exercise II – Write one to two paragraphs outlining the arguments, decisions, and impact of each on the Science of Friction Ridge Analysis for each of the following court cases: Daubert v. Merrel Dow Pharmaceuticals, US v. Byron Mitchell, US v Llera Plaza, and Mayfield v United States. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

32.4.6 Practical Exercise III – Prepare your curriculum vitae utilizing the appropriate template. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

32.4.7 Practical Exercise IV – Prepare a list of court qualifying questions related to latent print processing or comparison and provide sample answers to those questions that could be presented in a court of law. Pass/Fail.

	_____	_____	_____
Processing	Trainee	Trainer	Date
	_____	_____	_____
Comparison	Trainee	Trainer	Date

32.4.8 Practical Exercise V –Discuss court dress code, demeanor, and etiquette with your trainer. Explain to your trainer how to proceed if there is an objection and what the protocol is for referring to your notes. Discuss with your trainer what a "leading question is" and why it is important to remain accurate and transparent. Have your trainer go through your qualifying questions. Practice giving answers in a formalized manner. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

32.4.9 Practical Exercise VI–Your trainer will provide you with the set of direct questions that will be used during your mock court (NOTE: there are separate questions for processing and comparison/MBIS). Devise answers to these questions and practice your answers. Set up a meeting with your trainer and one other analyst to go over the set of questions given to you. Practice giving answers in a formalized manner. Pass/Fail.

_____	_____	_____

Processing	Trainee	Trainer	Date
	_____	_____	_____
Comparison	Trainee	Trainer	Date

32.4.10 Practical Exercise VII – Satisfactorily complete a mock court (NOTE: processing and comparison are separate). Mock court will include qualifying questions, direct examination, cross-examination, and re-direct. It will also include case specific testimony. The analyst will utilize a comparison chart of their own making during the comparison mock court. Pass/Fail.

	_____	_____	_____
Processing	Trainee	Trainer	Date
	_____	_____	_____
Comparison	Trainee	Trainer	Date

32.4.11 Practical Exercise VIII – Trainee shall generate a list of MBIS related court qualifying questions and provide sample answers to those questions that could be presented in a court of law. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

32.4.12 Practical Exercise IX – Trainee shall observer attend the testimony of two forensic scientists. Pass/Fail.

_____	_____	_____
Case #	Testifying Scientist	Date
_____	_____	_____
Case #	Testifying Scientist	Date

32.4.13 Practical Exercise X – Trainee shall view one fingerprint examiner testimony video from You Tube. Trainee shall take note what they thought the examiner did well and what they thought they could improve upon. They will then discuss their critique with their trainer. Pass/Fail.

_____	_____	_____	_____
Trial/Video	Date	Trainer Discussion	Date

32.5 Written Test – Module 30

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

33.0 Module 31: Multimodal Biometric Identification System (MBIS)

33.1 Background and Theory

Fingerprints are used as the foundation for criminal history records throughout the world. In 2016, the FBI's database was estimated to contain over 100 million fingerprint cards with the Idaho database having a little over half a million persons on file. Databases on all levels continue to grow with tens of thousands of individuals added to these repositories daily. These sophisticated computer file repositories are referred to as an Automated Fingerprint Identification System (AFIS) or Multimodal Biometric Identification System (MBIS). AFIS/MBIS is essentially a two part system: the ten-print system and the latent print system. The ten-print system is tasked with identifying sets of inked or Livescan fingerprints for criminal identification or employment purposes. The latent system is tasked with solving crimes through friction ridge impressions recovered from crime scenes or from items of evidence.

Idaho is a member of the Western Identification Network, Inc. (WIN). WIN was formed in 1988 to create a multi-state AFIS network. The members of WIN are Alaska, Montana, Oregon, Washington, Nevada, Utah, Wyoming, California and Idaho. WIN offers access to 20 million fingerprint records held within the western United States.

33.2 Objectives, Principles, and Knowledge

33.2.1 Understand automation technology and theory of operation to include:
The history of the development of friction ridge automation technology;
Theory of the operation of friction ridge automation technology, to include an understanding of distortion that may occur when three-dimensional friction ridge skin is captured as a two-dimensional image.

33.2.2 Understand the function and use of image capture to include:
Types of friction ridge recordings (e.g. rolled, flat, simultaneous, palm);
Methods of friction ridge capture (e.g. ink, livescan);
Types of capture devices (e.g. livescan, flatbed, camera);
Point of capture variables (e.g. condition of fingers, condition of platen, rolling speed, movement);
Control measures needed to achieve quality friction ridge images (e.g. scan resolution, compression rate, equipment maintenance, calibration);
Procedures for addressing amputations, temporary injuries, skin conditions, and rescans.

33.2.3 Understand the function and use of Multimodal Biometric Identification Systems (MBIS) to include:

MBIS process related to acquisition, classification, searching, storage, retrieval, identification, and final reporting of friction ridge records;
Friction ridge search criteria (e.g. designated finger search, how many fingers, palm areas);
Importance of quality assurance on maintaining the integrity of friction ridge data;
Quality controls that ensure completeness, image quality, and data integrity.

33.2.4 Gain a working knowledge of the NEC Multimodal Biometric Identification System (MBIS) and the Integrated Automated Fingerprint Identification System (IAFIS) to include:
Who handles component maintenance and calibration;
System requirements and limitations including text data fields, fingerprint and palm print quality, finger sequence and image replacement, image rotation, and toleration for pattern interpretation;
Minutia recognition, placement, rotation, ridge counts, and other minutiae factors related to searching and matching;
Limitations of system interoperability;
Integration of friction ridge image, mug shot, scars, marks, tattoos, minutiae, other biometrics, as well as personal descriptors, and criminal history information;
Search parameters, pattern classification and referencing, minutiae extraction, search algorithms, significance in the range of candidate scores, threshold scoring, and candidate list comparisons, matching;
AFIS search capabilities in regards to latent print vs. ten print, ten print vs. latent print, latent print vs. latent print, ten print vs. ten print, and palm print vs. palm print;
"Lights out" processing of searches and mobile search capabilities;
Logical search progression (i.e. state, regional, national);
Filtering criteria used to establish logical candidates (e.g. finger position, sex, classification, race, offense, geographic location);
Search result contents (e.g. ranked order, unique identifier, finger or palm position);
Differences between AFIS digital images and original friction ridge impressions (e.g. potential loss of quality due to compression of image, monitor resolution, capture resolution);
Printer technology limitations vs. examinations from original friction ridge documents (e.g. paper quality, inked fingerprint cards);
AFIS processes related to latent print searches;
Various search options among databases within the system (e.g. image, feature);
Manual and automatic encoding of minutiae;
File penetration benefits and liabilities of partial vs. full data base searches;
Record authentication processes (e.g. correct association of name, unique identifier, friction ridge images, and criminal history record).

33.3 Health and Safety Hazards

33.3.1 N/A

33.4 Reading and Practical Exercises

33.4.1 Complete Module 31 Reading List

_____	_____	_____
Trainee	Trainer	Date

33.4.2 The Trainee will review the AFIS Course Binder and satisfactorily and pass the associated test.

_____	_____	_____
Trainee	Trainer	Grade

33.4.3 Practical Exercise I – Complete 20 MBIS searches through ID/WIN and the FBI working as "the hands of the Trainer" as defined by the ISPFS Quality/Procedure Manual. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

33.4.4 MBIS Competency Test: Trainee will independently search 5 mock latent prints through the Multimodal Biometric Identification System. Competency test prints may consist of palm prints, low minutia prints, distorted prints, and non-matching prints. This competency test will be entered into ILIMS, as such, Trainee will need to document searches, attach proper MBIS documentation, and issue a report.

_____	_____	_____
Trainee	Trainer	Date

33.5 Written Test – Module 31

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

34.0 Module 32: DNA Database Fingerprint Comparison

34.1 Background and Theory

Friction ridge identification and classification has a long history rooted in scientific research and empirical observations.

Various classification systems have been used over the past 100 years. Today's classification systems rely mainly upon computers to digitize, categorize, recall, and identify matching 10-print cards.

Examiners must be able to recognize and articulate the various patterns and sub-patterns and understand their use in analysis and comparison.

The scientific method is a method of research in which a problem is identified, relevant data is gathered, and a hypothesis is formulated from the data and then tested. In forensic science, it is imperative to have a scientific technique for examination. Doing so ensures that evidence is treated equally, and conclusions are reliable and unbiased. The latent print section utilizes ACE-V as part of the examination methodology. ACE-V is an acronym that stands for analysis (A), comparison (C), evaluation (E) and verification (V). It is the process that latent print examiners utilize to reach a conclusion about a comparison examination.

34.2 Objectives, Principles, and Knowledge

34.2.1 Understand the basic biology and physiology of friction ridge skin.

34.2.2 Understand the basic foundations of the science of friction ridge identification (persistence and uniqueness).

34.2.3 Understand common terminology and definitions associated with friction ridge pattern recognition (arch, loop, and whorl).

34.2.4 Ability to differentiate between pattern types.

34.2.5 Understand friction ridge characteristics (dots, ridge endings, and bifurcations) the varying definitions/interpretations assigned to combinations of those three ridge characteristics, and how they may be utilized in effecting identification.

34.2.6 Ability to successfully analyze and compare known fingerprint cards to plain inked fingerprint impressions.

34.2.7 Ability to render an accurate conclusion (identification, inconclusive, exclusion).

34.2.8 Understand the necessity for verification by another qualified latent print examiner.

34.3 Health and Safety Hazards

34.3.1 N/A

34.4 Reading and Practical Exercises

34.4.1 Complete Module 32 Reading List

_____	_____	_____
Trainee	Trainer	Date

34.4.2 Practical Exercise I – Trainer led lesson on comparison.

_____	_____	_____
Trainee	Trainer	Date

34.4.3 Practical Exercise II – Trainer led lesson on DNA database card documentation.

_____	_____	_____
Trainee	Trainer	Date

34.4.4 Practical Exercise III – Pattern recognition – "100 fingerprints". Passing score is 80%.

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

34.4.5 Practical Exercise IV – 300 DNA Database Card Comparisons. Passing score is 100% of identifications effected are correct. Due to examiner skill level or card quality, there may be comparisons that were attempted, but unable to be completed – this is to be expected.

_____	_____	_____
Trainee	Trainer	Date

34.5 Written Test – Module 32

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

34.6 Comparison Competency Test- Trainee will independently analyze and compare 10 DNA Database Card Samples. Trainee will need to complete all appropriate documentation.

_____	_____	_____
Trainee	Trainer	Date

Appendix I – Reading Lists

Module 1 Reading List: History and Background of Friction Ridge Identification

Fingerprint Techniques - Andre Moenssens
Chapter 1 - The History of Fingerprinting _____ _____

Advances in Fingerprint Technology, 2nd edition - Lee, Gaensslen
Chapter 1 - History and Development of Fingerprinting. _____ _____

The Fingerprint Sourcebook – Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al
Chapter 1 - History _____ _____

Quantitative-Qualitative Friction Ridge Analysis - David R. Ashbaugh.
Chapter 2 - History of Fiction Ridge Identification _____ _____

Module 1 Supplemental Information Packet _____ _____

Module 2 Reading List: Other Scientific Personal Identification Methods

Biometrics Overview pdf
_____ _____

Iris Recognition pdf
_____ _____

Face Recognition pdf
_____ _____

Vascular Pattern Recognition pdf
_____ _____

Hand Geometry pdf
_____ _____

Criminalistics, 9th edition Richard Saferstein
Chapter 13, "DNA" Pages 380-418 _____ _____
Chapter 16, "Document and Voice Examination" Pages 496-521 _____ _____

Death Investigator's Handbook by Louis N. Eliopulos,
Chapter 67 "Forensic Odontology Pages 679 – 693 _____ _____

Forensic Science Handbook Volume 1, 2nd Edition, - Richard Saferstein.

"Handwriting and Handprinting Identifications." Pages 710-717 _____ _____

Module 3 Reading List: Safety Training

Latent Print Section Quality Manual sections:
Safety _____ _____
Chemicals, Supplies, and Reagent Preparation _____ _____
Equipment, Calibration, Maintenance and Repair _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.
Section 3.2 – Working Safely _____ _____

Module 4 Reading List: Case Management and Reporting for Processing

ISO/IEC 17025:2017 Section 7.8 Reporting of results _____ _____

ISPFS Quality/Procedure Manual
Section on "Technical records" _____ _____
Section on "Facilities and Environmental Conditions" _____ _____
Section on "Reporting of Results" _____ _____

Latent Print Section Quality Manual - Documentation and Report Writing
_____ _____

Guideline - SWGFAST Document 5 Standard for Reporting Friction Ridge Examinations (Latent/Tenprint) or the OSAC successor document _____ _____

ISPFS BEAST ILIMS General User Guide _____ _____

Module 5 Reading List: Digital Preservation of Latent Prints

User's manual for the Nikon D810 _____ _____

User's manual for the Cannon EOS 6D _____ _____

User's manual for the Epson V700/V800/V850 pro _____ _____

Latent Print Section AM Section - Digital Imaging Procedure _____ _____

Foray Adams v6 User Manual and Adams Web Help files _____ _____

Guideline - SWGFAST Document 6 Standard for Friction Ridge Digital Imaging or the OSAC successor document _____ _____

Guideline - SWGIT Section 8 General Guidelines for Capturing Latent Impressions Using a Digital Camera or the OSAC successor document _____ _____

Guideline - SWGIT Section 19 Issues Relating to Digital Image Compression and File Formats or the OSAC successor document _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 16, Digital Imaging – Sections 16.1-16.3 _____ _____

A Short Course in Photography, Digital – London & Stone
Chapter 1 - Camera _____ _____
Chapter 2 - Lens _____ _____
Chapter 3 - Light and Exposure _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.
Section 5.VE – Visual Examination _____ _____

National Centre for Forensic Studies - Fingermark Detection & Enhancement 6th Edition– Stoilovic & Lennard, Chapter 6 - Digital Imaging _____ _____

Crime Scene Photography, 2nd Edition – Robinson
Chapter 1 – History of Forensic Imaging _____ _____
Chapter 2 - Composition and Cardinal Rules _____ _____
Chapter 3 - Basic Exposure (non-flash) Concepts _____ _____
Chapter 4 – Focus, Depth of Field, and Lenses _____ _____
Chapter 6 - Crime Scene Photography – "Close up Photographs" 336-341 _____ _____
Chapter 7 – Ultraviolet, Infrared and Fluorescence _____ _____
Chapter 10 - Digital Imaging Technologies _____ _____

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 8 - The preservation of Friction Ridges. _____ _____

Fingerprints and other Ridge Skin Impressions, 2nd Edition - Champod et al
Section 3.5 – Photography _____ _____

Module 6 Reading List: General Latent Print Processing

Latent Print Section AM - General Latent procedure to include Quick Reference Sequential Processing Guide _____ _____

Latent Print Section Quality Manual – Evidence Control and Handling _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.
Section 2.1 – An Introduction to Forensic Evidence Recovery _____ _____
Section 2.2 – Understanding Fingermarks _____ _____
Section 2.3 – Fingermark Visualisation Processes _____ _____
Section 2.5 – Using and Understanding Fingermark Evidence _____ _____

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 7 - Latent Print Development _____ _____
Chapter 11 – Equipment _____ _____

Fingerprint Detection with Lasers – Menzel
Chapter 7 – Sections 7.1 & 7.2 _____ _____

Fingerprints and other Ridge Skin Impressions, 2nd Edition - Champod et al
Chapter 4 - Fingerprint Detection Techniques _____ _____

Module 7 Reading List: Processing Technique – Alternate Light Sources

Latent Print Section AM - Alternate Light Source _____ _____

Applicable ALS User Manuals _____ _____

Fingerprints and other Ridge Skin Impressions, 2nd Edition - Champod et al
Sections 3.3-3.4 – Light theory _____ _____

An Introduction to Lasers, Forensic Lights, and Fluorescent Fingerprint Detection Techniques, by A. Roland Menzel. _____ _____

Fingerprint Detection with Lasers – Menzel
Chapter 9 – Excitation Optimization and Filters _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski

Chapter 7, Miscellaneous Methods and Challenging Surfaces - Section 7.1.3 _____ _____

National Centre for Forensic Studies - Fingermark Detection & Enhancement 6th Edition– Stoilovic & Lennard
Chapter 2 - General Nature of Light _____ _____
Chapter 3 - Optical Filters _____ _____
Chapter 4 - Optical Examination Techniques _____ _____
Chapter 5 - Forensic Light Sources _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.
Section 5.FE – Fluorescence Examination _____ _____
Note: additional readings for this section were covered in Module 6

Module 8 Reading List: Processing Technique – Amido Black

Latent Print Section AM - Amido Black _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 6 Blood Reagents, Section 6.1 & 6.2 (pgs. 129-134 & 140-141) _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.
Section 5.AD – Acid Dyes _____ _____

Paper – "Summary of Experiments Investigating the Impact of Fingerprint Processing and Fingerprint Reagents on PCR-based DNA Typing Profiles." _____ _____

Paper – "Chemical Enhancement of Fingerprints in Blood: An Evaluation of Methods, Effects on DNA, and Assessment of Chemical Hazards." _____ _____

Paper – "The Effect of Common Fingerprint Detection Techniques on the DNA Typing of Fingerprints Deposited on Different Surfaces. JFI, Vol. 54, No. 1, 2004 _____ _____

Paper – Presumptive Testing for Blood on a Patent Print Developed with Amido Black." _____ _____

Paper – "Deposition of Bloody Friction Ridge Impressions." JFI, Vol. 58, No. 3, 2008 _____ _____

Paper – "Developing Fingerprints in Blood: A Comparison of Several Chemical Techniques." JFI, Vol. 57, No. 1, 2007 _____ _____

Note: additional readings for this section were covered in Module 6

Module 9 Reading List: Processing Technique – 1, 8-Diazafluoren-9-One (DFO), 1, 2 – Indanedione, and 1, 2 – Indanedione TP

Latent Print Section AM - DFO _____ _____

Latent Print Section AM 1, 2 – Indanedione _____ _____

Latent Print Section AM 1, 2 – Indanedione TP _____ _____

Fingerprint Detection with Lasers – Menzel
Chapter 8 - Sections 8.3, 8.5, & 8.6 _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 2 Amino Acid Reagents Sections: 2.4 & 2.5 _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.

Section 5.DFO – DFO _____ _____

Section 6.1.25-6.1.31 – Indandione _____ _____

Paper – "Spectral Variations for Reaction Products Formed between Different Amino Acids and Latent Finger mark Detection Reagents on a Range of Cellulose-Based Substrates. JFI, Vol. 59, No. 3, 2009 _____ _____

Paper – "The Effectiveness of 1, 2-Indandione-Zinc Formulations and Comparison with HFE-Based 1, 8-diazafluoren-9-one for Fingerprint Development." JFI Vol. 59, No. 6, 2009 _____ _____

Paper – "DFO, Its Usage and Results," Masters, Morgan & Shipp _____ _____

Paper – "1, 2-Indandiones: New Reagents for Visualizing the Amino Acid Components of Latent Prints." JFS Vol. 43, No. 4. 1998, pp. 744 – 747. _____ _____

Paper – "Optimisation and Evaluation of 1, 2-indanedione For Use as a Fingermark Reagent and Its Application to Real Samples." Forensic Science International. Vol. 168. 2007, pp. 14 – 26. _____ _____

Paper – "Thermal Paper: Latent Friction Ridge Development via 1, 2 Indanedione. JFI, Vol.53 (3), pp. 265-271 _____ _____

Note: additional readings for this section were covered in Module 6

Module 10 Reading List: Processing Technique – Dye Stains – Rhodamine 6G and RAM

Latent Print Section AM - Rhodamine 6G _____ _____
Latent Print Section AM - RAM _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.
Section 5.SFDS – Superglue Fluorescent Dye Staining _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 5 Vapor/Fuming Methods, Section 5.1.6 (pgs. 105-114) _____ _____

Fingerprint Detection with Lasers – Menzel
Chapter 7 – Section 7.3 _____ _____

Note: additional readings for this section were covered in Module 6

Module 11 Reading List: Processing Technique – Gentian Violet/Crystal Violet

Latent Print Section AM - Gentian Violet _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.
Section 5.BV3 – Basic Violet 3 _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 1, Vapor/Fuming Methods Section 5.1 (pgs. 113-114) _____ _____

Paper – "Development of Latent Fingerprints on Sticky Surfaces by Dye Staining or Fluorescent Brightening." _____ _____

Note: additional readings for this section were covered in Module 6

Module 12 Reading List: Processing Technique – Iodine

Latent Print Section AM - Iodine _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation*

Manual. 2014. Center for Applied Science and Technology.
Section 6.1.32-6.1.40 – Iodine Fuming _____ _____

The Science of Fingerprints - FBI. "Iodine Method." Pages 175-177 _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 5 Vapor/Fuming Methods, Section 5.2 _____ _____

Note: additional readings for this section were covered in Module 6

Module 13 Reading List: Processing Technique – Leuco Crystal Violet (LCV)

Latent Print Section AM - Leuco Crystal Violet _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.
Section 6.1.42 – Leuco Crystal Violet _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 6 Blood Reagents, Section 6.1 & 6.2 (pgs. 148-149) _____ _____

Paper – "Lueco Crystal Violet: A Simple, Effective Blood Enhancement Reagent."
_____ _____

Note: additional readings for this section were covered in Module 6

Module 14 Reading List: Processing Technique – Ninhydrin and ThermaNin

Latent Print Section AM - Ninhydrin _____ _____
Latent Print Section AM ThermaNin _____ _____

CARON Fingerprint Development Chamber Operations Manual _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 2, Amino Acid Reagents Sections: 2.1, 2.4, & 2.5 _____ _____
Chapter 7, Challenging Surfaces, Sections 7.2 (pgs. 163-165) _____ _____

The Science of Fingerprints - FBI. "Ninhydrin Method." Pages 177-179
_____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation*

Manual. 2014. Center for Applied Science and Technology.
Section 5.Nin – Ninhydrin _____ _____

Paper – "Procedure to Develop Latent Prints on Thermal Paper" _____ _____

Paper – "Latent Fingerprints by a Superior Ninhydrin Method" _____ _____

Paper – "Ninhydrin Processing by Pat A. Wertheim" _____ _____

Paper – "Determining the Length of Time Required for Ninhydrin Development," JFI, 2017, Vol. 67, No. 4, 2017 _____ _____

Paper - "The Effectiveness of Ninhydrin Latent Prints Verses Physical Developer Latent Prints, with Regards to Climatic Conditions at the Time of Deposition" _____ _____

Paper – "Improved Results in the Development of Latent Fingerprints on Thermal Paper." JFI, Vol. 58, No. 4, 2008 _____ _____

Paper - "A Limited Validation and Comparison of 1, 2 Indanedione and ThermaNin for Latent Print Development on Thermal Paper." JFI, Vol. 66(3), pp. 245-256 _____ _____

Paper – "Thermal & Carbonless Papers: A Fundamental Understanding for Latent Friction Ridge Development." JFI, Vol. 53(2), pp. 185-197 _____ _____

Paper – "Chemical Fuming: A Practical Method for Fingerprint Development on Thermal Paper." JFI, Vo. 56, No. 3, 2006 _____ _____

Note: additional readings for this section were covered in Module 6

Module 15 Reading List: Processing Technique – Powder Development of Latent Prints

Latent Print Section AM - Powder Detection Methods _____ _____
Latent Print Section AM - Lifting Methods _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 1, Powder Methods Section 1.1 (pgs. 1-5) _____ _____

The Science of Fingerprinting - FBI. Chapter 14, "Powdering and Lifting Latent Impressions." Pages 173-174 _____ _____

Fingerprint Techniques, by Andre A. Moenssens, Chapter 4, "Latent Prints," Pages 106-114

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.

Section 5.Lif – Lifting _____ _____

Section 5.Pow – Powders _____ _____

Section 6.2.12 – Powders (Fluorescent) _____ _____

Paper – "Evaluation of Fingerprint Powders." JFI, Vol. 56, No. 2, 2006 _____ _____

Paper – Beware of the Possibility of Fingerprint Techniques Transferring DNA," Journal of Forensic Science, Vol.50, No.6, 2005 _____ _____

Module 15 Supplemental Information Packet _____ _____

Note: additional readings for this section were covered in Module 6

Module 16 Reading List: Processing Technique – Physical Developer (PD)

Latent Print Section AM - PD _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 3 Metal Deposition Methods: Section 3.2 _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.

Section 5.PD – Physical Developer _____ _____

Paper – "Physical Developer" - David Burow _____ _____

Paper – "Physical Developer: A Practical and Productive Latent Print Developer" _____ _____

Paper – "PD, Maleic Acid and Synperonic N" _____ _____

Paper – "The Efficacy of Commercial vs. Noncommercial Physical Developer Solutions and the Sequential Enhancement of Friction Ridge Impressions Using Potassium Iodide." JFI, Vol. 60 No. 1, 2010 _____ _____

Paper – "Physical developer method for detection of latent fingerprints: A review." Egyptian Journal of Forensic Sciences _____ _____

Note: additional readings for this section were covered in Module 6

Module 17 Reading List: Processing Technique – RECOVER LFT

Latent Print Section AM – RECOVER LFT _____ _____

Foster+Freeman, "RECOVER Latent Fingerprint Technology User Manual," 2019

_____ _____

Idaho State Police Forensic Services, Latent Print Section, Foster+Freeman RECOVER LFT Validation, 2022 _____ _____

Paper "Recovery of Fingermarks from Fired Ammunition and Detonated Improvised Explosive Devices using S_2N_2 – A proof of Concept Study." JFI, Vol. 70, No. 1 2020

_____ _____

Module 18 Reading List: Processing Technique – Small Particle Reagent (SPR)

Latent Print Section AM - SPR _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.
Section 5.SPR – Small Particle Reagent _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 1, Powder Methods Section 1.2.1 _____ _____

Paper – "Development of Latent Prints Using Titanium Dioxide (TiO2) in Small Particle Reagent, White (SPR-W) on Adhesives." JFI, Vol. 55, No. 3, 2005 _____ _____

Paper - "Report of Validation Testing" Sirchie SPR-W by Albuquerque Police

_____ _____

Paper – "Small Particle Reagent" by Pat A. Wertheim _____ _____

Paper – "Lightning Powder Co. Technical Note Small Particle Reagent" _____ _____

Note: additional readings for this section were covered in Module 6

Module 19 Reading List: Processing Technique – Sticky Side Powder/Sticky Side Powder Equivalent

Latent Print Section AM - Sticky Side Powder _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation*

Manual. 2014. Center for Applied Science and Technology.
Section 5.PS – Powder Suspension _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 1, Powder Methods Section 1.2.2 & 1.2.3 _____ _____

Paper – "Homemade Solution for Processing Latent Prints on the Adhesive Side of Tape."
_____ _____

Paper - "A Black Powder method to Process Adhesive Tapes." _____ _____

Paper – "Anomalous Results with Sticky Side Powder." _____ _____

Paper – "A New Approach to Unraveling Tangled Adhesive Tape or Potential Detection of Latent Prints and Recovery of Trace Evidence _____ _____

Paper – "Does CA Fuming Interfere with Powder Suspension Processing?" JFI, Vol. 59, No. 2, 2009
_____ _____

Paper – "The Effects of Cyanoacrylate Fuming and Rhodamine 6G on the Adhesive side of Tape when Processing with Adhesive-side Powders" JFI, Vol. 70, No. 1, 2020
_____ _____

Note: additional readings for this section were covered in Module 6

Module 20 Reading List: Processing Technique – Sudan Black

Latent Print Section AM - Sudan Black _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.
Section 5.SB – Solvent Black 3 _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 4 Lipid Reagents, Section 4.1 _____ _____

Friction Ridge Skin, by James F. Cowger, "Locating, Developing, Preserving, and Collecting Evidence Prints." Page 104 _____ _____

Note: additional readings for this section were covered in Module 6

Module 21 Reading List: Processing Technique – Cyanoacrylate Ester (Super Glue)

Latent Print Section AM - Cyanoacrylate Ester _____ _____

MEGAfume User Manual _____ _____

SAFEFUME Cyanoacrylate Fuming Chamber Operating Manual _____ _____

"Fast Vac" – Operating Instructions – CAE Vacuum chambers _____ _____

"AMETEK" – Use and Installation of Pressure Gauges – CAE Vacuum chambers _____ _____

Home Office Center for Applied Science and Technology (CAST). *Fingerprint Visualisation Manual*. 2014. Center for Applied Science and Technology.
Section 5.SF – Superglue Fuming _____ _____

Lee and Gaensslen's Advances in Fingerprint Technology, 3rd Edition - Ramotowski
Chapter 5 Vapor/Fuming Methods, Section 5.1 (pgs. 98-105 & 115-116) _____ _____

Chapter 11 Cyanoacrylate Fuming Method _____ _____

Paper – "A Modified Cyanoacrylate Technique Utilizing Treated Neutral Filter Paper for Developing Latent Fingerprints" _____ _____

Paper - "Fivis by 3M – Instructions and Notes" _____ _____

Paper - "Effects of Cyanoacrylate Processing on Cocaine HCL Trace Analysis" _____ _____

Note: additional readings for this section were covered in Module 6

Module 22 Reading List: Digital Imaging

Latent Print Section AM - Digital Imaging Procedure _____ _____

FORAY Adams V6 User Mannual and review AdamsWeb Help File _____ _____

Review Current Adobe Photoshop user manual (highlighted sections on Photoshop manual reading document) _____ _____

Techniques of Crime Scene Investigation, Sixth Edition - Barry A. J. Fisher Page 113 _____ _____

Crime Scene Photography, 2nd Edition – Robinson
Chapter 11 - Digital Imaging Processing of Evidentiary Photography _____ _____

A Short Course in Photography, Digital – London & Stone
Chapter 4 - Digital Workplace Basics _____ _____
Chapter 5 - Image Editing _____ _____

Criminalistics 9th edition, An Introduction to Forensic Science - Richard Saferstein. Pages 452-454, 509-510 _____ _____

Advances in Fingerprint Technology, 2nd edition - Lee & Gaensslen. Page 267
_____ _____

Guideline - SWGFAST Document 6 Standard for Friction Ridge Impression Digital Imaging (Latent/Tenprint) or the OSAC successor document _____ _____

ASTM Standard Terminology for Digital and Multimedia Evidence Examination E2916-19e1 (See Trainer or Discipline Lead)
_____ _____

Guideline - SWGIT Section 5 Guidelines for Image Processing or the OSAC successor document
_____ _____

Guideline - SWGIT Section 11 Best Practices for Documenting Image Enhancement or the OSAC successor document _____ _____

Paper – "Digital Enhancement of Latent Prints using Adobe Photoshop Black & White Adjustments." JFI, Vol. 59, No. 4, 2009 _____ _____

Paper – "Image Enhancement and Adobe Photoshop: Using Calculations to Extract Image Detail." JFI, Vol. 57, No. 4, 2007 _____ _____

Paper – "Techniques for Digital Enhancement of Latent Prints Obscured by Disruptive Backgrounds." JFI, Vol. 54, No. 2, 2004 _____ _____

Paper – "Computer Fingerprint Enhancement: The Joy of Lab Color." JFI, Vol. 62, No. 5, 2012
_____ _____

Paper – "Adapting Narrow Bandpass Filters to Photography." JFI, Vol. 62, No. 3, 2012
_____ _____

Paper – "Improved Multiple Exposure and Panoramic Photography of Latent Fingerprints." JFI, Vol. 63, No. 1, 2013 _____ _____

Module 23 Reading List: Biology and Physiology of Friction Ridge Skin

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 2 - Anatomy and Physiology of Adult Friction Ridge Skin _____ _____
Chapter 3 - Embryology and Morphology of Friction Ridge Skin _____ _____

Scott's Fingerprint Mechanics - Robert D. Olsen Sr., Pages 114-125 _____ _____

Fingerprint Techniques – Andre Moenssens
Chapter 2 - The Nature of Friction Skin _____ _____
Chapter 11, Pages294-297 _____ _____

Finger Prints, Palms and Soles - Harold Cummins and Charlie Midlo
Chapter 10 - Embryology _____ _____
Chapter 12 - Inheritance _____ _____

Advances in Fingerprint Technology, 2nd Edition - Lee & Gaensslen,
Chapter 3 - Composition of Latent Print Residue _____ _____

Quantitative-Qualitative Friction Ridge Analysis - David R. Ashbaugh.
Chapter 3 - Friction Ridge Medium _____ _____

Fingerprints and Other Friction Ridge Skin Impression - Christophe Champod et. al.
Chapter 1 - Friction Ridge Skin _____ _____

Paper – "The Critical Stage of Friction Ridge Skin and Pattern Formation - Kasey Wertheim and Alice Maceo _____ _____

Paper – "Qualitative Assessment of Skin Deformation: A Pilot Study." JFI, Vol. 59, No. 4, 2009 _____ _____

Paper – "Discriminability of Fingerprints of Twins." JFI, Vol. 58, No. 1, 2008 _____ _____

Paper – "Fingerprint Patterns: A Study on the Finger and Ethnicity Prioritized Order of Occurrence." JFI, Vol. 55, No. 4, 2005 _____ _____

Paper – "Permanent Intentional Fingerprint Mutilation" - Kasey Wertheim _____ _____

Paper – "An Extreme Case of Fingerprint Mutilation." JFI, Vol. 48, No. 4, 1998 _____ _____

Paper – "Fingerprint Formation," Kucken, Journal of Theoretical Biology, Vol. 235, No. 1, 2005 _____ _____

Module 24 Reading List: Recording Inked Fingerprints, Palm Prints, and Footprints

Latent Print Section AM Section – Taking Known Exemplars _____ _____

Scott's Fingerprint Mechanics - Robert D. Olsen Sr.
Chapter 2 - Taking Finger, Palm, and Footprints _____ _____

Fingerprint Techniques - Andre A. Moenssens
Chapter 5, “Recording Prints.” Pages 137-145. _____ _____

The Science of Fingerprints - FBI
Chapter 9, “Techniques for Taking Good Fingerprints.” Pages 111-115_____ _____
Chapter 10, “Problems in Taking Inked Fingerprints.” Pages 116-128 _____ _____

Finger Prints, Palm and Soles - Harold Cummins, Charles Midlo
Chapter 3, “Methods of Printing.” Pages 45-55 _____ _____

Friction Ridge Skin - James F. Cowger
Chapter 2, “Taking Inked Prints.” Pages 9-33 _____ _____

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 4, “Recording Living and Postmortem Friction Ridge Skin Exemplars,” sections 4.1-4.3
_____ _____

Module 25 Reading List: Friction Ridge Pattern Recognition and Interpretation

Criminalistics, 9th edition - Richard Saferstein
Chapter 14 “Classification of Fingerprints.” Pages 435-436 _____ _____

Scott’s Fingerprint Mechanics - Robert D. Olsen Sr.
Chapter 1 Sections 7 Fingerprint Classification,” 8 “Space Value on Fingerprint Cards,” and 9 “Fingerprint Patterns are Complex Yet Simple.” Pages 17-21 _____ _____

Friction Ridge Skin, by James F. Cowger
Chapter 3 - Classification _____ _____

Fingerprint Techniques - Andre A. Moenssens
Chapter 3 - Pattern Interpretation _____ _____
Chapter 6 - Fingerprint Classification in the United States _____ _____

Fingerprints and the Law - Andre Moenssens
Chapter 2, “Fingerprint Principles and Techniques.” Pages 10-23 _____ _____

The Science of Fingerprints - The FBI.
Chapters - 2-8. Pages 5-110 _____ _____

The Fingerprint Sourcebook - Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.

Chapter 5 - Systems of Fingerprint Classification _____ _____

Module 26 Reading List: Introduction to Latent Prints and the State of the Science

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 14 - Scientific Research Supporting the Foundations of Friction Ridge Examinations
_____ _____

Executive Summary Strengthening Forensic Science in the United States: A Path Forward By the Committee on Identifying the Needs of the Forensic Sciences Community, National Research Council 2009 _____ _____

NIST/NIJ Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach, the Report of the Expert Working Group on Human Factors in Latent Print Analysis 2012
Chapter 1 _____ _____

International Association of Identification "Position Statement on Conclusions, Qualified Opinions, and Probability Modeling" & "Resolution 2016-4"
_____ _____

Module 27 Reading List: Human Factors

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 15: Special Abilities and Vulnerabilities in Forensic Expertise_____ _____

Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach, The Report of the Expert Working Group on Human Factors in Latent Print Analysis 2012
Chapters 2 – Human Factors and Errors _____ _____
Chapter 3 - Interpreting Latent Prints _____ _____
Chapter 7 – A Systems Approach to the Work Environment _____ _____
Chapter 8 – Training and Education _____ _____

Paper "The Authority of Fingerprint Experts: Is it Based on Belief or Science?" JFI, Vol. 59, No. 6, 2009 _____ _____

Paper – "Why Experts Make Errors." JFI Vol. 56, No. 4, 2006 _____ _____

Paper – "A Report of Latent Print Examiner Accuracy During Comparison Training Exercises." JFI, Vol. 56, No. 1, 2006 _____ _____

Paper – "Subjective- The Misused Word." William Leo. JFI Vol. 58, No. 1, 2008

Paper - "Accuracy and Reliability of Forensic Latent Fingerprint Decisions." Ulery et al. PNAS, Vol. 61, No. 4, 2011

Paper - "Latent Fingerprint Quality: A Survey of Examiners." Hicklin et al. JFI, Vol. 61, No. 4, 2011

Paper - "Measuring what Latent Fingerprint Examiners Consider Sufficient Information for Individualization Determinations." Ulery et al. PLoS ONE, Vol. 9, No. 11, 2014

Paper - "Understanding the sufficiency of information for fingerprint value determinations." Ulery et al. Forensic Science International, Vol. 226, No. 1, 2013

Paper - "Inter-examiner variation of minutia markup on latent fingerprints." Ulery et al. Forensic Science International, Vol. 264, March, 2016

Paper - "Repeatability and Reproducibility of Decisions by Latent Fingerprint Examiners." Ulery et al. PLoS ONE, Vol. 7, No. 3, 2012

Paper - "Changes in latent fingerprint examiner' markup between Analysis and Comparison." Ulery et al. Forensic Science International, Vol. 247, 2014

Paper - "The forensic confirmation bias: Problems, perspectives and proposed solutions." Kassin et al. Journal of Applied Research in Memory and Cognition, Vol. 2, 2013

Paper – "Confirmation Bias, Ethics and Mistakes in Forensics," JFI,Vol. 56, No. 4, 2006

Paper – Contextual bias and cross-contamination in the forensic sciences: implications for investigations, plea bargains, trials and appeals." Law, Probability and Risk, 2014

Module 28 Reading List: Analysis, Comparison, Evaluation, and Verification (ACE-V)

ISPFS Latent Print Section AM – Friction Ridge Examination Methodology

Guideline - SWGFAST Document 10 Standards for Examining Friction Ridge Impressions and Resulting Conclusions (Latent/Tenprint) or the OSAC successor document

Friction Ridge Skin - James F. Cowger
Chapter 6 - The Basis for Comparison"
Chapter 7 - Comparing Prints
Chapter 8 - Some Comparisons of Evidence Prints

Scott's Fingerprint Mechanics - Robert D. Olsen Sr. Pages 5-46, 171-175_____ _____

Fingerprint Techniques - Andre A. Moenssens,
Chapter 10 - Comparison of Fingerprints _____ _____

Palm Print Comparison Techniques course packet - Ron Smith _____ _____

Advances in Fingerprint Technology, 2nd Edition - Lee & Gaensslen.
Chapter 2 - Identification of Latent Prints _____ _____

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 9 - Examination Process _____ _____
Chapter 12 - Quality Assurance _____ _____

Quantitative-Qualitative Friction Ridge Analysis - David R. Ashbaugh
Chapters 4 - The Identification Process _____ _____
Chapter 5 - Poroscopy and Edgeoscopy _____ _____

Analysis of Distortion in Latent Prints course packet – Alice Maceo _____ _____

Fingerprints and Other Ridge Skin Impressions - Champod, et. al., Second Edition
Chapter 2 – The Friction Ridge Identification Process _____ _____

Paper - "Detection of Forged and Fabricated Latent Prints" Pat A. Wertheim, JFI Vol. 44, No. 6. 1994 _____ _____

Paper- "Fingerprints What They Can & Cannot Do!" Allan McRoberts The Print Vol. 10(6), June 1994
Pages 1-3 _____ _____

Paper - "The Ability Equation" Pat A. Wertheim _____ _____

Paper - "Forensic Individualization of Images Using Quality and Quantity of Information." John Vanderkolk, JFI, Vol. 49. No. 3, 1999 _____ _____

Paper - "ACE-V and the Scientific Method." JFI Vol. 60 No.1, 2010 _____ _____

Paper – "The Investigation of the Reproducibility of Third-Level Characteristics," JFI Vol. 61, No.2, 2011. _____ _____

Paper - "Scientific Comparison and Identification of Fingerprint Evidence." Pat. Wertheim. Fingerprint Whorld Vol. 26, No. 101, July 2000 _____ _____

Paper - "Distortion Versus Dissimilarity in Friction Skin Identification." William Leo. JFI, Vol. 48, No. 2, 1998 _____ _____

Paper - "A Performance Study of the ACE-V Process: A Pilot Study to Measure the Accuracy, Precision, Reproducibility, Repeatability, and Biasability of Conclusions Resulting from the ACE-V Process." JFI, Vol. 59, No. 2, 2009 _____ _____

Paper - "Incipient Ridges and the Clarity Spectrum" David R. Ashbaugh. JFI Vol.42. No. 2 1992 _____ _____

Paper - "Level 3 Details and Their Role in Fingerprint Identification: A Survey among Practitioners." JFI, Vol.58. No. 5, 2008 _____ _____

Paper - "The Etiology of ACE-V and its Proper Use: An Exploration of the Relationship between ACE-V and the Scientific Method of Hypothesis Testing." JFI, Vol. 56 No. 3, 2006 _____ _____

Paper – "Palmar Flexion Crease Identification" David R. Ashbaugh Identification Canada Jan/Feb/March 1992 _____ _____

Paper – "Coins in the Pocket: A Simple Explanation of Quantitative – Qualitative Friction Ridge Analysis." JFI, Vol. 55, No. 3, 2005 _____ _____

Paper – "Assessing the Clarity of Friction Ridge Impressions." Forensic Science International, Vol.226, No. 1, 2012 _____ _____

Paper – "Fingerprint analysis for the determination of hand origin (right/left) using the axis slant in whorl patterns." Forensic Science Research, Vol.7, No. 2, 2022 _____ _____

Module 29 Reading List: Case Management and Reporting for Comparison and/or MBIS

Latent Print Section Quality Manual - Casework Documentation and Report Writing _____ _____

ISPFS Quality/Procedure Manual
Section on "Technical records" _____ _____
Section on "Reporting of results" _____ _____

ASCLD/LAB-International Supplemental Requirements for the Accreditation of Forensic Science Testing Laboratories Appendix C- Latent Print Examination Records. _____ _____

Guideline - SWGFAST Document 8 Standard for the Documentation of Analysis, Comparison, Evaluation, and Verification (ACE-V) (Latent) or the OSAC successor document _____ _____

Guideline - SWGFAST Document 5 Standard for Reporting Friction Ridge Examinations (Latent/Tenprint) or the OSAC successor document _____ _____

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 10 - Documentation of Friction Ridge Impressions from the Scene to the Conclusion

Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach, The Report of the Expert Working Group on Human Factors in Latent Print Analysis 2012
Chapter 5 - Reports and Documentation

Module 30 Reading List: Court Procedures, Related Laws, Expert Testimony, Criminal and Civil Procedures Applicable to Latent Prints

Guideline - SWGIT Section 17 Digital Imaging Technology Issues for the Courts or the OSAC successor document

Friction Ridge Skin - James F. Cowger,
Chapter 9 – Reporting and Testifying to Conclusions

Fingerprint Techniques - Andre A. Moenssens, Pages 270-280

Fingerprints and the Law - Andre A. Moenssens
Chapters 7 - Fingerprint Evidence in Criminal Cases
Chapter 8 - Fingerprints in Non-Criminal Cases
Chapter 9 – The Prosecutor's Approach to Fingerprint Evidence
Chapter 10 – The Defense approach to Fingerprint Evidence
Chapter 11 – The Fingerprint Witness in Court

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 13 – Fingerprints and the Law

Law for the Expert Witness - Daniel A. Bronstein

Advances in Fingerprint Technology, 2nd Edition - Lee and Gaensslen
Chapter 10 – The Expert Fingerprint Witness
_____Crime Scene Photography, 2nd Edition – Robinson
Chapter 12 – Legal Issues Related to Photographs and Digital Images

Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach, the Report of the Expert Working Group on Human Factors in Latent Print Analysis 2012
Chapter 6 – Testimony

National Commission of Forensic Science: Presentation of Expert Testimony Policy Recommendations, 2012 _____ _____

Paper – "Qualifying as an Expert Fingerprint Witness: Designing a Set of Questions to Assist in Court Testimony." Pat A. Wertheim. JFI, Vol. 40, No. 2 1990 _____ _____

Department of Justice Uniform Language for Testimony and Reports for the Forensic Latent Print Discipline 08/20. https://www.justice.gov/olp/page/file/1083691/download
_____ _____

Module 31 Reading List: Multimodal Biometric Identification System (MBIS)

ISPFS Latent Print Section AM – MBIS _____ _____

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 6 - Automated Fingerprint Identification System (AFIS) _____ _____

Criminalistics, 9th edition - Richard Saferstein
Chapter 14 - "AFIS" Pages 436-440 _____ _____

Advances in Fingerprint Technology 2nd edition Lee, Gaensslen
Chapter 8 – Automated Fingerprint Identification and Imaging Systems_____ _____

NEC – Integra-ID Integrated Biometric Workstation Latent User Guide (current version)
_____ _____

NEC – IBW Latent Quick Reference (current version)
_____ _____

NEC- IBW Application Keyboard Shortcuts (current version)
_____ _____

NEC –Archive Quick Reference (current version)
_____ _____

NEC WIN Best Practices for Latent Examiners V 1.0, 11/6/2020
_____ _____

Universal Latent Workstation Training Guide ULW Version 6.6.7, July 2020
_____ _____

Universal Latent Workstation (ULW) Version 6.6.7 Supplemental Instructions October 2017 or its successor document _____ _____

Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach, The Report of the Expert Working Group on Human Factors in Latent Print Analysis 2012

Chapters 4 – Looking Ahead to Emerging and Improving Technology _____ _____

PowerPoint "ULW-WEB" _____ _____

Paper – "A Latent Print Examiner's Guide to IAFIS" JFI, Vol. 57, No. 4, 2007
_____ _____

Paper – "Determination of AFIS "sufficiency" in friction ridge examination" Forensic Science International, Vol. 263, 2016 _____ _____

Module 32 DNA Database Comparison Training

Friction Ridge Skin, by James F. Cowger
Pages 129-206. _____ _____

Guideline - SWGFAST Document 10 Standards for Examining Friction Ridge Impressions and Resulting Conclusions (Latent/Tenprint) or the OSAC successor document
_____ _____

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 9 - Examination Process _____ _____

Forensic Pathways webpage/article – Confirmation Bias, Ethics, and Mistakes in Forensics "The eyes are not responsible when the mind does the seeing." _____ _____

Latent Print Section AM - Friction Ridge Examination Methodology _____ _____

Latent Print Section Quality Manual – Documentation and Report Writing
Sections 9.8 and 9.9 _____ _____