LATENT PRINT EXAMINER

TRAINING MANUAL

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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.
11	Minor wording changes and updated numbering throughout; updated sections 6.2.6, 7.4.3.2, 8.1, 15.4.4, 28.2.3, 34.2.2; added sections 6.4.3-6.4.5, 30.4.7, 30.4.8, and updated readings in modules 4-6, 26, 28, and 31.
12	Complete manual update.
13	Add sections 34.6 and 34.7; updated section 4.4.4; removed section 33.4.3; and updated readings in modules 4.0, 5.0, 7.0, and 10.0.
14	Added sections 18.4.3 and 36.4.4; updated sections 8.4.3, 14.4.3, 24.4.4, and 29.4.2; and updated readings in modules 4.0, 9.0, 10.0, 12.0, 15.0, 16.0, 18.0, 19.0, 25.0, 33.0, and 40.0.

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 Examiner. 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 examiners within the section.

Each Trainee shall have a Primary Trainer. It is recommended that examiners have at least three to five years of competency in all areas of training prior to being assigned as a Primary Trainer. Other examiners within the section may be asked to assist with individual modules or exercises at the primary trainer's discretion. These examiners shall have acquired the minimum competencies themselves prior to assisting with examiner training.

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 trainee 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 Discipline Lead, if necessary. The training may be abbreviated for trainees 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 Discipline Lead prior to the trainee 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 Primary Trainer, who reports progress to the Discipline Lead and 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 Comparison Sign Off

Friction Ridge Skin

3.0: Features on the Surface of the Friction Ridge Skin	_____ Trainer	_____ Date
4.0: Categorization and the Use of Features on the Surface of the Friction Ridge Skin	_____ Trainer	_____ Date
5.0: General Anatomy of the Friction Ridge Skin	_____ Trainer	_____ Date
6.0: General Physiology of the Friction Ridge Skin	_____ Trainer	_____ Date
7.0: Wound Healing in the Friction Ridge Skin	_____ Trainer	_____ Date
8.0: Aging of the Friction Ridge Skin	_____ Trainer	_____ Date
9.0: Common Disorders of the Friction Ridge Skin	_____ Trainer	_____ Date
10.0: Embryological Development of the Hands and Feet	_____ Trainer	_____ Date
11.0: Embryological Development of the Friction Ridge Skin	_____ Trainer	_____ Date
12.0: Developmental Noise, Developmental Stability, and Fluctuating Asymmetry	_____ Trainer	_____ Date

Empirical Observations and Research

13.0: History	_____ Trainer	_____ Date
14.0: Introduction to Fingerprint Classification Systems	_____ Trainer	_____ Date
15.0: Professional Organizations	_____ Trainer	_____ Date
16.0: Twin Fingerprints	_____ Trainer	_____ Date
17.0: Fingerprint Pattern Distribution and Fingerprint Minutiae Distribution	_____ Trainer	_____ Date
18.0: Statistics and Fingerprint Probability Models	_____ Trainer	_____ Date

Introduction to Fingerprints, Proximal and Middle Phalange Prints, Palm Prints, & Foot Prints

19.0: Full and Partial Exemplar Fingerprints	_____ Trainer	_____ Date
20.0: Tip and Edge Exemplar Fingerprints	_____ Trainer	_____ Date
21.0: Full and Partial Exemplar Proximal and Middle Phalange Prints	_____ Trainer	_____ Date

22.0: Full and Partial Exemplar Palm Prints _____ _____
Trainer Date

23.0: Full and Partial Exemplar Foot Prints _____ _____
Trainer Date

24.0: Recording Fingerprints, Palm Prints, and Foot Prints _____ _____
Trainer Date

Examination Method

25.0: Introduction to Logic and Reasoning _____ _____
Trainer Date

26.0: Visual Interpretation of Ridge Detail in Latent Prints: Residue _____ _____
Trainer Date

27.0: Visual Interpretation of Ridge Detail in Latent Prints: Contact _____ _____
Trainer Date

28.0: Visual interpretation of Ridge Detail in Latent Prints: Surfaces _____ _____
Trainer Date

29.0: Visual Interpretation of Ridge Detail in Latent Prints: Processing Technique _____ _____
Trainer Date

30.0: Introduction to Digital Imaging _____ _____
Trainer Date

31.0: Analysis _____ _____
Trainer Date

32.0: Comparison _____ _____
Trainer Date

33.0: Evaluation _____ _____
Trainer Date

34.0: Case Management and Reporting for Comparison and/or MBIS _____ _____
Trainer Date

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

Performance Studies

36.0: Introduction to Error Rate Calculations and Confidence Intervals _____ _____
Trainer Date

37.0: Expert Versus Novice Studies _____ _____
Trainer Date

38.0: Expert Studies _____ _____
Trainer Date

Human Factors and Quality Assurance

39.0: Human Factors _____ _____
Trainer Date

40.0: Quality Assurance _____ _____
Trainer Date

Modules for Latent Print Processing Sign Off

41.0: Laboratory Safety and Reagent Preparation	_____ Trainer	_____ Date
42.0: Equipment Maintenance and Performance Checks	_____ Trainer	_____ Date
43.0: Forensic Photography & Digital Preservation of Latent Prints	_____ Trainer	_____ Date
44.0: General Latent Print Processing	_____ Trainer	_____ Date
45.0: Processing Technique – Alternate Light Sources	_____ Trainer	_____ Date
46.0: Processing Technique – Amido Black	_____ Trainer	_____ Date
47.0: Processing Techniques – 1, 8, Diazafluoren-9-One (DFO) and 1, 2, Indanedione	_____ Trainer	_____ Date
48.0: Processing Technique – Dye Stains – Rhodamine 6G and RAM	_____ Trainer	_____ Date
49.0: Processing Technique – Gentian Violet/Crystal Violet	_____ Trainer	_____ Date
50.0: Processing Technique – Iodine	_____ Trainer	_____ Date
51.0: Processing Technique – Leuco Crystal Violet (LCV)	_____ Trainer	_____ Date
52.0: Processing Technique – Ninhydrin/Thermanin	_____ Trainer	_____ Date
53.0: Processing Technique – Powder Development of Latent Prints	_____ Trainer	_____ Date
54.0: Processing Technique – Physical Developer (PD)	_____ Trainer	_____ Date
55.0: Processing Technique – RECOVER LFT	_____ Trainer	_____ Date
56.0: Processing Technique – Small Particle Reagent (SPR)	_____ Trainer	_____ Date
57.0: Processing Technique – Sticky Side Powder	_____ Trainer	_____ Date
58.0: Processing Technique – Sudan Black	_____ Trainer	_____ Date
59.0: Processing Technique – Cyanoacrylate Ester (Super Glue®)	_____ Trainer	_____ Date
60.0: Case Management and Reporting for Processing	_____ Trainer	_____ Date

35.0: Court Procedures, Related Laws, Expert Testimony, Criminal and Civil

_____ _____
Trainer Date

Module for Multimodal Biometric Identification System Sign Off

Completion of Latent Print Comparison is a pre-requisite for MBIS

61.0: Multimodal Biometric Identification System

_____ _____
Trainer Date

Module for DNA Database Card Comparison Sign Off

62.0: DNA Database Fingerprint Comparison

_____ _____
Trainer Date

Module Administrative and Technical Review Sign Off

63.0: Administrative and Technical Review

_____ _____
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 Discipline Lead

The Discipline Lead shall assess any prior applicable training, review and/or modify the current training plan to reflect the trainee's prior training, assign the appropriate modules, and organize the training. The Discipline 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 Discipline 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 Discipline 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 Discipline Lead shall forward all required documentation to the Quality Manager. The Discipline Lead may designate a Primary Trainer.

2.3 Primary Trainer

The Primary Trainer shall provide a copy of the training plan to the Trainee with an anticipated timeline for completion. The Primary Trainer is responsible for coordination of practical exercises, demonstrating techniques, reviewing assignments, providing feedback, and administration of module tests. The Primary Trainer should monitor for comprehension and competency in theoretical knowledge and basic practical skills. The Primary Trainer shall communicate progress, delays, or the need for supplemental activities to the Discipline Lead and Supervisor. Deficiencies should be openly discussed among the Trainee, Trainer, Discipline Lead and 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 Discipline Lead and Primary Trainer to include activities accomplished during the week (readings/exercises completed, casework observed, classes attended, etc.). They should keep the Discipline Lead and Primary 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 examiner 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 Features on the Surface of Friction Ridge Skin

3.1 Background and Theory

Latent print examiners need to have a thorough understanding of the common features found on friction ridge skin. These features include ridges, furrows, patterns, cores, deltas, flexion creases, secondary creases, wrinkles, and incipient ridges. Examiners also need to understand the robustness of the features (3D attributes) and the expected reproducibility (recordability) of those features when the skin contacts a surface.

3.2 Objectives, Principles, and Knowledge

3.2.1 The trainee shall be able to indicate pattern regions in the friction ridge skin, including cores and deltas.

3.2.2 The trainee shall be able to identify the flexion creases in the friction ridge skin of the hands and feet.

3.2.3 The trainee shall be able to describe how flexion creases should record when the skin contacts a surface.

3.2.4 The trainee shall be able to identify ridges and furrows in the friction ridge skin.

3.2.5 The trainee shall be able to describe how ridges and furrows should record when the skin contacts a surface.

3.2.6 The trainee should be able to identify incipient ridges in the friction ridge skin.

3.2.7 The trainee shall be able to describe factors that affect the reproducibility of incipient ridges when the skin contacts a surface.

3.2.8 The trainee shall be able to identify secondary creases and wrinkles in the friction ridge skin.

3.2.9 The trainee shall be able to describe factors that affect the reproducibility of secondary creases and wrinkles when the skin contacts a surface.

3.3 Health and Safety Hazards

3.3.1 N/A

3.4 Reading and Practical Exercises

3.4.1 Complete 3.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

3.4.2 Practical Exercise I – Devise a game or other activity that will incorporate all of the key terms 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

3.4.3 Practical Exercise II – Obtain packet from your trainer. Mark cores areas with yellow highlighter, mark delta areas with orange highlighter; mark incipient ridges with pink highlighter, mark the major flexion creases with green sharpie, and mark secondary creases and wrinkles with red sharpie. Label the parts of the palms and soles and label the major creases with their appropriate names. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

3.4.4 Practical Exercise III – Answer the following questions with your trainer as if you are answering them for a jury. How do flexion creases record when the skin contacts a surface? How do ridges and furrows record? What factors affect the reproducibility of incipient ridges? What factors affect the reproducibility of secondary creases and wrinkles? Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

3.5 Written Test – 3.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

4.0 Categorization and Use of Features on the Surface of the Friction Ridge Skin

4.1 Background and Theory

This portion of the training program introduces the categorization of friction ridge features and the significance of the observed data during the examination process.

4.2 Objectives, Principles, and Knowledge

4.2.1 The trainee shall be able to list the features of the friction ridge skin.

4.2.2 The trainee shall be able to explain why friction ridge features can be used to establish the anatomical region and distal orientation of hands and feet.

4.2.3 The trainee shall be able to explain why friction ridge features of the hands and feet can be used to include or exclude subjects from an unknown (questioned) print.

4.3 Health and Safety Hazards

4.3.1 N/A

4.4 Reading and Practical Exercises

4.4.1 Complete 4.0 Reading List.

_____ _____ _____
Trainee Trainer Date

4.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 3.0. 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

4.4.3 Practical Exercise II – Obtain packet from your trainer. Trace the ridge flows in the provided impressions. Discuss the patterns you see with your trainer. How can these patterns be used during the comparison process? Pass/Fail.

_____ _____ _____
Trainee Trainer Date

4.4.4 Practical Exercise III – Obtain packet from your trainer. Mark ending ridges with yellow highlighter, bifurcations with orange highlighter; mark dots with blue highlighter; mark incipient ridges with pink highlighter, mark the major flexion creases with green sharpie, and mark secondary creases and wrinkles with red sharpie. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

4.4.5 Practical Exercise IV – Obtain packet from your trainer. Predict the anatomical region and orientation of each print. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

4.4.6 Practical Exercise V - Answer the following questions with your trainer as if you are answering them for a jury. What features exist in friction ridge skin that allow you to be able to establish anatomical region and orientation? How can these features be used to include or exclude subjects from as the source of latent impressions? Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

4.5 Written Test – 4.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

5.0 General Anatomy of the Friction Ridge Skin

5.1 Background and Theory

This portion of the training program includes the general anatomy of the friction ridge skin to include the following concepts: epidermis, dermis, basement membrane, hypodermis, primary ridges, secondary ridges, keratin, keratinocyte, melanocyte, leukocyte, dermal papilla, sweat glands, and Merkel cells.

5.2 Objectives, Principles, and Knowledge

5.2.1 The trainee shall be able to identify the epidermis, dermis and hypodermis of the friction ridge skin.

5.2.2 The trainee shall be able to describe the primary functions of the epidermis, dermis and hypodermis.

5.2.3 The trainee shall be able to identify primary and secondary ridges of the friction ridge skin.

5.2.4 The trainee shall be able to explain the relationship between the primary ridges and the surface ridges.

5.2.5 The trainee shall be able to explain the relationship between the secondary ridges and the surface furrows.

5.2.6 The trainee shall be able to explain the significance of the dermal papilla as a support structure for the skin.

5.2.7 The trainee shall be able to explain the significance of the basement membrane as an attachment site between the epidermis and dermis.

5.2.8 The trainee shall be able to describe the general structure and function of sweat glands in the friction ridge skin.

5.2.9 The trainee should be able to list the main cell types found in the epidermis of the friction ridge skin and the primary function of each cell type.

5.2.10 The trainee should be able to describe keratin and explain the importance of keratin distribution in friction ridge skin.

5.2.11 The trainee shall be able to support the persistency of the arrangements of the mature friction ridge features with the physical connections within the friction ridge skin that stabilize the positions of the features in friction ridge skin.

5.2.12 The trainee should be able to relate the importance of the banding of Merkel cells in the pre-patterning of primary ridge formation.

5.3 Health and Safety Hazards

5.3.1 N/A

5.4 Reading and Practical Exercises

5.4.1 Complete 5.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

5.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 3.0. 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

5.4.3 Practical Exercise II – Make a Power Point that encompasses objectives 5.2.1 through 5.2.12. Present your Power Point to the section. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

5.5 Written Test – 5.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

6.0 General Physiology of the Friction Ridge Skin

6.1 Background and Theory

This portion of the training program includes the general physiological processes within the friction ridge skin to include the following concepts: keratinocyte mitosis, transient amplifying cells, layers of the epidermis, differentiation of the keratinocytes, and regulation of cell mitosis.

6.2 Objectives, Principles, and Knowledge

6.2.1 The trainee shall be able to identify the five layers of the epidermis in the friction ridge skin.

6.2.2 The trainee should be able to describe the sequence of changes that take place as keratinocytes differentiate.

6.2.3 The trainee should be able to discuss the importance of the transient amplifying cells in maintaining the three-dimensional height of the surface ridges.

6.2.4 The trainee should be able to explain the major pathways for regulating basal keratinocyte mitosis.

6.2.5 The trainee shall be able to support persistency of the arrangements of the mature friction ridge features. This should include the ability to describe the physiological processes within the friction ridge skin that regulate basal keratinocyte mitosis and stabilize the robustness of the features.

6.3 Health and Safety Hazards

6.3.1 N/A

6.4 Reading and Practical Exercises

6.4.1 Complete 6.0 Reading List.

_____ _____ _____
Trainee Trainer Date

6.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 3.0. 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

6.4.3 Practical Exercise I – Write a one-page paper describing friction ridge skin growth and cell proliferation. Include all objectives listed above. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

6.4.4 Practical Exercise II – Explain to your trainer how/why mature friction ridge arrangements are persistent. Does the same stand true for non-mature features (incipients)? Pass/Fail.

_____ _____ _____
Trainee Trainer Date

6.5 Written Test – 6.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

7.0 Wound Healing in the Friction Ridge Skin

7.1 Background and Theory

This portion of the training program includes the skin's response to an injury, the appearance of healing skin, and the formation and the appearance of scars.

7.2 Objectives, Principles, and Knowledge

7.2.1 The trainee shall be able to summarize the basic process of wound healing in the skin.

7.2.2 The trainee should be able to explain the possible outcomes of healing skin (e.g., no scar, visible scar, or invisible scar) and why these different outcomes arise.

7.2.3 The trainee should be able to identify healing skin in impressions of friction ridge skin.

7.2.4 The trainee should be able to describe the attributes that support the determination of actively healing skin.

7.2.5 The trainee shall be able to discuss the expected reproducibility of the attributes of healing friction ridge skin.

7.2.6 The trainee shall be able to identify scars in impressions of friction ridge skin.

7.2.7 The trainee shall be able to describe the attributes that support the assignment of "scar" to the feature.

7.2.8 The trainee shall be able to compare impressions taken from the same friction ridge skin pre-scar and post-scar.

7.2.9 The trainee shall be able to assess the changes in arrangements of the mature friction ridge features in pre-scar and post-scar impressions of the friction ridge skin.

7.3 Health and Safety Hazards

7.3.1 N/A

7.4 Reading and Practical Exercises

7.4.1 Complete 7.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

7.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 3.0. 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

7.4.3 Practical Exercise II – Obtain packet from your trainer. Mark areas of scaring or skin damage with a highlighter. If you believe something to be a scar verses temporary damage, list the features that indicate its status as a scar. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

7.4.4 Practical Exercise III – Obtain and complete scar comparison exercise from your trainer. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

7.4.5 Practical Exercise IV - Answer the following questions with your trainer as if you are answering them for a jury. Describe the process of wound healing? What are the attributes of healing skin? Are these attributes reproducible? What determines if an injury to friction ridge skin will result in a scar or is just temporary damage? How can these features be used to include or exclude subjects as the source of latent impressions? Pass/Fail.

_____ _____ _____
Trainee Trainer Date

7.5 Written Test – 7.0

_____ _____ _____ _____
Trainee Trainer Date Grade

8.0 Aging of the Friction Ridge Skin

8.1 Background and Theory

This portion of the training program includes the expected changes that take place in the friction ridge skin as a person grows to adulthood and as an adult reaches later decades of life.

8.2 Objectives, Principles, and Knowledge

8.2.1 The trainee should be able to describe why foot and hand growth during adolescence disproportionately increases the length and width of friction ridges and furrows.

8.2.2 The trainee shall be able to recognize through a comparison of known exemplars the three common characteristics of impressions of late age friction ridge skin: flattened ridges, increased number of wrinkles, and increased prominence of incipient ridges.

8.2.3 The trainee should be able to explain why ridges tend to flatten in late-age friction ridge skin.

8.2.4 The trainee should be able to explain why wrinkles tend to increase in number in late-age friction ridge skin.

8.2.5 The trainee should be able to explain why incipient ridges tend to become more prominent in late-age friction ridge skin.

8.2.6 The trainee shall be able to compare impressions taken from the same friction ridge skin decades apart.

8.2.7 The trainee shall be able to assess the changes that have occurred with age in friction ridge impressions taken decades apart.

8.3 Health and Safety Hazards

8.3.1 N/A

8.4 Reading and Practical Exercises

8.4.1 Complete 8.0 Reading List.

_____ _____ _____
Trainee Trainer Date

8.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 3.0. 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

8.4.3 Practical Exercise II - Obtain and complete age comparison exercise from your trainer. Chart the prints from left to right, using different layers for minutia and creases. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

8.4.4 Practical Exercise III - Answer the following questions with your trainer as if you are answering them for a jury. What changes does friction ridge skin undergo as a person ages? Why do the ridges tend to flatten out? Why do the number of wrinkles tend to increase as a person ages? How do these appear in fingerprint impressions? Do incipient ridges tend to become more or less prominent with age? Why? Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

8.5 Written Test – 8.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

9.0 Common Disorders of the Friction Ridge Skin

9.1 Background and Theory

This portion of the training program introduces common disorders of friction ridge skin. It will include psoriasis, epidermal warts, dissociated ridges, dysplasia, split ridges, and smoothing of friction ridges due to chemotherapy drug administration.

9.2 Objectives, Principles, and Knowledge.

9.2.1 The trainee should be able to identify psoriasis in impressions of friction ridge skin.

9.2.2 The trainee should be able to describe the attributes that support the determination of psoriasis.

9.2.3 The trainee should be able to discuss the expected reproducibility of the attributes of psoriasis in impressions of the friction ridge skin.

9.2.4 The trainee should be able to identify warts in impressions of friction ridge skin.

9.2.5 The trainee should be able to describe the attributes that support the assignment of "wart" to a feature.

9.2.6 The trainee should be able to discuss the expected reproducibility of the attributes of warts in impressions of the friction ridge skin.

9.2.7 The trainee should be able to identify the presence of the following conditions in friction ridge skin and discuss their expected reproducibility in impressions: dissociated ridges, dysplasia, split ridges, and smoothing of friction ridges due to chemotherapy drug administration.

9.3 Health and Safety Hazards

9.3.1 N/A

9.4 Reading and Practical Exercises

9.4.1 Complete 9.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

9.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 3.0. 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

9.4.3 Practical Exercise II - Obtain and complete the Friction Ridge Skin disorders exercise from your trainer. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

9.4.4 Practical Exercise III – Describe to your trainer how skin conditions such as psoriasis may appear in friction ridge skin impressions. How might reproducibility be affected? How may warts appear in friction ridge skin and what is their expected reproducibility? How do conditions such as dissociated ridges or dysplasia appear and what is their expected reproducibility? Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

9.5 Written Test – 9.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

10.0 Embryological Development of the Hands and Feet

10.1 Background and Theory

This portion of the training program includes the basic embryological development of the hands and feet to include development of the hand and foot paddles and formation of the digits, volar pads, and flexion creases.

10.2 Objectives, Principles, and Knowledge

10.2.1 The trainee shall be able to recite the sequence and timing of the embryological formation of the hand and foot paddles.

10.2.2 The trainee shall be able to recite the process of the formation of the digits on the hands and feet.

10.2.3 The trainee shall be able to define "volar pads" and identify the standard volar pad locations in the hands and feet.

10.2.4 The trainee shall be able to recite the sequence and timing of volar pad formation on the hands and feet.

10.2.5 The trainee shall be able to recite the sequence and timing of volar pad regression on the hands and feet.

10.2.6 The trainee shall be able to recite the sequence and timing of flexion crease formation on the hands and feet.

10.2.7 The trainee shall be able to explain how the overall development of the hands and feet, volar pads, and flexion creases impart variable growth stresses across the volar surfaces.

10.3 Health and Safety Hazards

10.3.1 N/A

10.4 Reading and Practical Exercises

10.4.1 Complete 10.0 Reading List.

_____ _____ _____
Trainee Trainer Date

10.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 3.0. 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

10.4.3 Practical Exercise II – Make a Power Point that encompasses objectives 10.2.1 through 10.2.7. Present your Power Point to the section. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

10.5 Written Test – 10.0

_____ _____ _____ _____
Trainee Trainer Date Grade

11.0 Embryological Development of the Friction Ridge Skin

11.1 Background and Theory

This portion of the training program includes the morphogenesis of the fiction ridges and furrows and the impact of variable growth stresses on the ridge flows and patterns found on friction ridge skin.

11.2 Objectives, Principles, and Knowledge

11.2.1 The trainee should be able to describe the morphogenesis of the primary ridges including the patterning of the capillary beds and free nerve endings in the dermis and the organization of the Merkel cells into bands in the epidermis prior to primary ridge formation.

11.2.2 The trainee should be able to recite the sequence of regional development of the primary ridges in the friction ridge skin.

11.2.3 The trainee should be able to assess the relationships between the volar pads and timing of primary ridge development with different pattern types and different ridge counts.

11.2.4 The trainee should be able to assess the relationships between major ridge flows in the friction ridge skin with the overall hand and foot growth and presence of flexion creases.

11.2.5 The trainee should be able to explain the development of additional primary ridges and minutia as the primary ridges proliferate across the surface of the developing friction ridge skin.

11.2.6 The trainee should be able to recite the sequence of regional development of the secondary ridges in the friction ridge skin.

11.2.7 The trainee should be able to describe the maturation of the surface ridges, furrows, and sweat glands.

11.3 Health and Safety Hazards

11.3.1 N/A

11.4 Reading and Practical Exercises

11.4.1 Complete 11.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

11.4.2 Practical Exercise I– Continue adding to the game or other activity you developed in 3.0. 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

11.4.3 Practical Exercise II – Find and read two articles (published within the past 20 years) on the biology and physiology of friction ridge skin. Write a short synopsis of each of the papers. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

11.4.4 Practical Exercise III – Devise a mechanism to explain the growth and timing of friction ridge skin in the fetus to your trainer. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

11.5 Written Test – 11.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

12.0 Developmental Noise, Developmental Stability, and Fluctuating Asymmetry

12.1 Background and Theory

This portion of the training program includes the impact of developmental stability, fluctuating asymmetry, and developmental noise on the embryological growth of the hands, feet, and friction ridge skin.

12.2 Objectives, Principles, and Knowledge

12.2.1 The trainee should be able to define genotype and phenotype.

12.2.2 The trainee should be able to explain the differences between genotype and phenotype.

12.2.3 The trainee should be able to explain ontogenetic variability.

12.2.4 The trainee should be able to explain inherent developmental variation.

12.2.5 The trainee should be able to explain developmental stability and developmental noise.

12.2.6 The trainee should be able to explain the relationship between inherent developmental variation and developmental noise.

12.2.7 The trainee should be able to explain the impact of genotype, environment, and developmental noise on a phenotype.

12.2.8 The trainee should be able to explain fluctuating asymmetry.

12.2.9 The trainee should be able to describe the relationship between fluctuating asymmetry and developmental noise.

12.2.10 The trainee should be able to assess observed similarities in patterns and ridge counts on the opposite fingers of the same person with the concept of developmental stability.

12.2.11 The trainee should be able to assess observed dissimilarities in patterns and ridge counts on the opposite fingers of the same person with the concepts of fluctuating asymmetry and developmental noise.

12.2.12 The trainee should be able to support the discriminating power of the arrangements of the mature friction ridge features and articulate the concepts of inherent developmental variation, fluctuating asymmetry, and developmental noise.

12.3 Health and Safety Hazards

12.3.1 N/A

12.4 Reading and Practical Exercises

12.4.1 Complete 12.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

12.4.2 Practical Exercise I– Continue adding to the game or other activity you developed in 3.0. 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

12.4.3 Practical Exercise II – Obtain packet from your trainer. Note observed similarities and dissimilarities in patterns and ridge counts on the opposite fingers and/or palms of the same person. Discuss with your trainer what you observed. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

12.4.4 Practical Exercise III - Explain to your trainer, as you might a jury, the concepts of genotype, phenotype, developmental stability, developmental noise, fluctuating asymmetry. What is the impact of genotype, environment, and developmental noise on a phenotype and what is their relationship to friction ridge skin? Pass/Fail.

_____ _____ _____
Trainee Trainer Date

12.5 Written Test – 12.0

_____ _____ _____ _____
Trainee Trainer Date Grade

13.0 History

13.1 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 observations 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).

This portion of the training program includes historical observations regarding the use of friction ridge impressions. This history covers the earliest uses in Asia, Europe, South America, and North America.

13.2 Objectives, Principles, and Knowledge

13.2.1 The trainee shall be able to recall the circumstances of the earliest known uses of friction ridge impressions as a means of identification in China, Japan, and India.

13.2.2 The trainee shall be able to list pioneering practitioners and their contributions to the use of friction ridge impressions, to include: Alphonse Bertillon, Edmond Locard, William Hershel, Azizul Haque, Chandra Bose, Edward Richard Henry, Juan Vucetich, Nehemiah Grew, Francis Galton, Henry Faulds, Henry DeForest, Mary Holland, Harold Cummins, Roy Huber, and David Ashbaugh.

13.2.3 The trainee shall be able to recall the basic circumstances of the following historical events that further established the use of friction ridge impressions as a means of identification: 1904 World's Fair, Will/William West Case, The Belper Committee, The Troup Committee, and the establishment of the FBI Identification Division.

13.2.4 The trainee shall be able to support the current use of friction ridge impressions as a means of personal identification in civil and criminal applications with the history of empirical observations.

13.3 Health and Safety Hazards

13.3.1 N/A

13.4 Reading and Practical Exercises

13.4.1 Complete 13.0 Reading List.

_____ _____ _____
Trainee Trainer Date

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

_____ _____ _____
Trainee Trainer Date

13.4.3 Practical Exercise II - Visit http://onin.com to familiarize yourself with this web site and the resources it offers including with regards to this module visit: http://onin.com/fp/. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

13.4.4 Practical Exercise III– Continue adding to the game or other activity you developed in 3.0. 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. Pass/Fail.

13.5 Written Test – 13.0

_____ _____ _____ _____
Trainee Trainer Date Grade

14.0 Introduction to Fingerprint Classification Systems

14.1 Background and Theory

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.

This portion of the training program includes the developers and basic elements of fingerprint classification systems.

14.2 Objectives, Principles, and Knowledge

14.2.1 The trainee should be able to recall the developers and basic element of the following classification systems: Johannes Purkinje's nine pattern classification, Syllabic System (Henry Faulds), Bertillon System of Anthropometry (Alphonse Bertillon), Tripartite Fingerprint Classification System (Francis Galton), Argentinian Fingerprint Classification System (Juan Vucetich), Henry Classification System (Azizul Haque, Chandra Bose and Edward Richard Henry), and National Crime Information Center (NCIC) Classification System (Federal Bureau of Investigation).

14.2.2 The trainee should be able to discuss the significance and relationships of the classification systems listed in 14.2.1.

14.2.3 The trainee should be able to consider the challenges with developing and implementing classification systems.

14.3 Health and Safety Hazards

14.3.1 N/A

14.4 Reading and Practical Exercises

14.4.1 Complete 14.0 Reading List.

_____ _____ _____
Trainee Trainer Date

14.4.2 Practical Exercise I - Continue adding to the game or other activity you developed in 3.0. Incorporate ALL of the names and classification systems 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. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

14.4.3 Practical Exercise II– Fingerprint Classification - Classify three fingerprint cards for both Primary Henry and individual pattern types (A – Arch, L – Loop, W – Whorl). Passing score is 80%.

_____ _____ _____ _____
Trainee Trainer Date Grade

14.5 Written Test – 14.0

_____ _____ _____ _____
Trainee Trainer Date Grade

15.0 Professional Organizations

15.1 Background and Theory

This portion of the training program includes empirical observations and opinions published by the International Association for Identification (IAI), as well as SWGFAST (Scientific Working Group on Friction Ridge Analysis, Study and Technology), OSAC (Organization of Scientific Area Committees for Forensic Science), AAAS (American Association for the Advancement of Science), PCAST (President's Council of Advisors on Science and Technology), NAS (National Academy of Sciences), NCFS (National Commission on Forensic Science), and AAFS (American Academy of Forensic Science).

15.2 Objectives, Principles, and Knowledge

15.2.1 The trainee should be able to recall the purpose and findings of the International Association for Identification Standardization Committee.

15.2.2 The trainee should be able to recall the purpose and findings of the International Association for Identification Standardization II Committee.

15.2.3 The trainee should be able to recall the International Association for Identification's opinion on requiring a pre-determined number of features for the identification of a friction ridge impression.

15.2.4 The trainee should be able to summarize the progression of the International Association for Identification's opinion on probabilistic testimony and the use of statistical models.

15.2.5 The trainee should be able to recall the purpose and scope of organizations such as: Organization of Scientific Area Committees (OSAC) for Forensic Science, AAFS Standards Board (ASB), NAS, and PCAST.

15.3 Health and Safety Hazards

15.3.1 N/A

15.4 Reading and Practical Exercises

15.4.1 Complete 15.0 Reading List.

_____ _____ _____
Trainee Trainer Date

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

_____ _____ _____
Trainee Trainer Date

15.4.3 Practical Exercise II – Make application to the IAI and/or PNWD-IAI.

_____ _____ _____
Trainee Trainer Date

15.4.4 Practical Exercise III – 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

15.5 Written Test –15.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

16.0 Twin Fingerprints

16.1 Background and Theory

This portion of the training program includes significant findings regarding patterns, ridge counts, and minutia from published research concerning friction ridge impressions from twins.

16.2 Objectives, Principles, and Knowledge

16.2.1 The trainee should be able to recall the percentage of monozygotic twins, dizygotic twins, and unrelated individuals that share the same pattern on the same finger.

16.2.2 The trainee should be able to compare different study designs and articulate reasons for variation in the findings with respect to the percentage of monozygotic twins, dizygotic twins, and unrelated individuals that share the same pattern on the same finger.

16.2.3 The trainee should be able to recall the percentage of monozygotic twins, dizygotic twins, and unrelated individuals that share the same ridge count on the same finger.

16.2.4 The trainee should be able to compare different study designs and articulate reasons for variation in the findings with respect to the percentage of monozygotic twins, dizygotic twins, and unrelated individuals that share the same ridge count on the same finger.

16.2.5 The trainee should be able to discuss the overall findings of the similarities and differences in minutia between monozygotic twins and non-twins.

16.2.6 The trainee should be able to explain the following concepts from biometric studies: False Acceptance Rate, False Rejection Rate, and Equal Error Rate.

16.2.7 The trainee should be able to describe the impact of twins on the False Acceptance Rate, False Rejection Rate, and Equal Error Rate in some biometric applications.

16.2.8 The trainee should be able to support the observed similarities in patterns and ridge counts on the same fingers of monozygotic twins with the concept of developmental stability.

16.2.9 The trainee should be able to support the observed dissimilarities in patterns and ridge counts on the same fingers of monozygotic twins with the concept of developmental noise.

16.2.10 The trainee should be able to support the use of friction ridge impressions as a means of personal identification in civil and criminal applications with findings from published twin research.

16.3 Health and Safety Hazards

16.3.1 N/A

16.4 Reading and Practical Exercises

16.4.1 Complete 16.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

16.4.2 Practical Exercise I – Create a graphic with information pertaining to the findings of monozygotic twins, dizygotic twins, and unrelated individuals studies. Present it to your trainer.

_____	_____	_____
Trainee	Trainer	Date

16.5 Written Test –16.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

17.0 Fingerprint Pattern Distributions and Fingerprint Minutiae

17.1 Background and Theory

This portion of the training program includes published research on the distribution of patterns on the fingers and the distribution of minutiae in fingerprints.

17.2 Objectives, Principles, and Knowledge

17.2.1 The trainee shall be able to describe the variation in pattern frequency by finger.

17.2.2 The trainee shall be able to describe the variation in ridge count by finger.

17.2.3 The trainee shall be able to describe the variation in minutiae count by finger.

17.2.4 The trainee shall be able to describe the variation in minutiae count by pattern.

17.2.5 The trainee shall be able to describe the variation in minutiae count by sex.

17.2.6 The trainee shall be able to describe the diversity of minutiae type by finger.

17.2.7 The trainee shall be able to describe the regional density of minutiae in fingerprints.

17.2.8 The trainee shall be able to describe how pattern influences minutiae direction.

17.2.9 The trainee shall be able to support the generally accepted principle that there is no scientifically valid minimum or maximum feature count necessary to support an identification using findings from published fingerprint pattern and minutiae studies.

17.3 Health and Safety Hazards

17.3.1 N/A

17.4 Reading and Practical Exercises

17.4.1 Complete 17.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

17.4.2 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? Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

17.4.3 Practical Exercise II - Enter the pattern, ridge count, tracing etc. information for these 5 prints in 17.4.2 into the following website and evaluate your suppositions. https://demo.hugin.com/example/FingerprintEvidence Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

17.4.1 Practical Exercise III - Explain to your trainer, as you might a jury, how ridge counts and minutia vary by finger, pattern, and sex. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

17.5 Written Test –17.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

18.0 Statistics and Fingerprint Probability Models

18.1 Background and Theory

This portion of the training program includes information about probability and statistics and introduces published fingerprint statistical models.

18.2 Objectives, Principles, and Knowledge

18.2.1 The trainee shall be able to define the following descriptive statistics terms: variable, data, mean, median, mode, range, standard deviation, probability (subjective and objective or empirical and classical), propositions and competing propositions, frequency distributions, and statistics.

18.2.2 The trainee should be able to recognize displays that illustrate the central tendency (e.g., mean, median, mode, etc.) and variability of descriptive data (e.g., standard deviation, range etc.).

18.2.3 The trainee should be able to explain the following concepts from probability theory: axioms of mathematical probability; definition of probability function; definition of conditional probability; transposition of a conditional probability; differences between a likelihood and a probability; relationship between probabilities and odds; components of the odds for Bayes' rule for binary variables (prior probability, likelihood ratio, posterior probability) and their relationship.

18.2.4 The trainee should be able to discuss the differences and relationship between descriptive and inferential statistics.

18.2.5 The trainee should be able to recognize the following concepts from inferential statistics: probability distribution and its parameters; difference between population parameters and sample statistics, methods to estimate a population proportion from a sample statistic; measurement error (including bias and random error), sampling error, and modeling error.

18.2.6 The trainee shall be able to distinguish between probability estimates calculated using an appropriate model and subjective estimates based upon observations interpreted using the examiner's experience.

18.2.7 The trainee shall be able to recognize examples of descriptive statistics and inferential statistics in fingerprint models.

18.2.8 The trainee should be able to recall the basic premise of fingerprint models that calculate a probability of random correspondence.

18.2.9 The trainee should be able to recall the basic premise of fingerprint models that calculate a likelihood ratio.

18.2.10 The trainee should be able to recognize the probability of random correspondence approach and the likelihood ratio approach in fingerprint models.

18.2.11 The trainee should be able to recognize the following conditional probabilities with respect to the results of fingerprint statistical modeling: sensitivity, specificity, false positive rate, false negative rate, positive predictive value,

negative predictive value, false positive discovery rate, and false negative discovery rate.

18.2.12 The trainee shall be able to evaluate the general strengths and limitations of fingerprint statistical models.

18.2.13 The trainee should be able to recall the generally accepted principle that there is no scientifically valid minimum or maximum feature count necessary to support an identification using findings from published articles describing fingerprint statistical models.

18.2.14 The trainee shall be able to support the use of friction ridge impressions as a means of personal identification in civil and criminal applications using findings from published articles describing fingerprint statistical models.

18.3 Health and Safety Hazards

18.3.1 N/A

18.4 Reading and Practical Exercises

18.4.1 Complete 18.0 Reading List.

_____ _____ _____
Trainee Trainer Date

18.4.2 Practical Exercise I - Continue adding to the game or other activity you developed in 3.0 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

18.4.3 Practical Exercise II – Discuss the general strengths and limitations of using statistics with regard to friction ridge examination with your trainer. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

18.5 Written Test –18.0

_____ _____ _____ _____
Trainee Trainer Date Grade

19.0 Full and Partial Exemplar Prints

19.1 Background and Theory

This portion of the training program includes the exploration of fully rolled exemplar fingerprints and the comparison of rolled fingerprints. The exploration of the rolled exemplar fingerprints includes the friction ridge features and the significance of the observed data. It also includes the exploration of clear, partial exemplar fingerprints and the comparison of partial exemplar fingerprints to rolled exemplar fingerprints. The partial fingerprints bear limited focal points (e.g., core is visible, but not the delta), reflect natural touches of a surface, and meet suitability criteria.

19.2 Objectives, Principles, and Knowledge

19.2.1 The trainee shall be able to describe the size and shape (outline) of rolled fingerprints.

19.2.2 The trainee shall be able to identify cores, deltas, and flexion creases in rolled fingerprints.

19.2.3 The trainee shall be able to assign pattern type, including sub-class, to rolled fingerprints.

19.2.4 The trainee should be able to describe the different ridge counts present in rolled fingerprints (e.g., core to delta, core to flexion crease, and delta to flexion crease).

19.2.5 The trainee should be able to assign inner, outer, and meet tracings in whorls.

19.2.6 The trainee shall be able to predict left/right handedness of rolled fingerprints based on pattern, ridge flows, and tracings and appropriately assign uncertainty to the prediction.

19.2.7 The trainee shall be able to describe the purpose, content, and organization of a typical tenprint record.

19.2.8 The trainee shall be able to recognize the distal orientation of rolled fingerprints using shape, ridge flows, cores, deltas, and creases.

19.2.9 The trainee shall be able to compare rolled impressions of the fingers to support conclusions with the appropriate weighting of observed data.

19.2.10 The trainee shall be able to discuss variations in appearance (dissimilarities) between rolled fingerprints from the same source.

19.2.11 The trainee shall be able to discuss coincidental similarities in appearance between rolled fingerprints from different sources.

19.2.12 The trainee shall be able to describe the size and shape (outline) of partial fingerprints.

19.2.13 The trainee shall be able to predict the distal orientation of partial fingerprints, consider the uncertainty of the prediction, and support the decision.

19.2.14 The trainee shall be able to predict left/right handedness of partial fingerprints, consider the uncertainty of the prediction, and support the decision.

19.2.15 The trainee shall be able to select effective target data in partial fingerprints.

19.2.16 The trainee shall be able to compare partial fingerprints to rolled fingerprints and interpret the observed data to include or exclude possible candidates.

19.2.17 The trainee shall be able to evaluate the similarities and dissimilarities (variations in appearance) between fingerprints from the same source.

19.2.18 The trainee shall be able to evaluate dissimilarities and coincidental similarities between fingerprints from different sources.

19.2.19 The trainee shall be able to support conclusions with the appropriate weighting of observed data.

19.3 Health and Safety Hazards

19.3.1 N/A

19.4 Reading and Practical Exercises

19.4.1 Complete 19.0 Reading List.

_____ _____ _____
Trainee Trainer Date

19.4.1 Practical Exercise I – Obtain packet from your trainer. Note the distal orientation of the provided prints and if they are most likely to be from the right or left hand. Passing score is 90%.

_____ _____ _____ _____
Trainee Trainer Date Grade

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

_____ _____ _____
Trainee Trainer Date

19.4.3 Practical Exercise III - Trainee will describe to their trainer, as they might a jury, the purpose, content and organization of a 10-print card, the size and shape of rolled fingerprints, what cores, deltas and flexion creases are. The trainee will also discuss variations in appearance (dissimilarities) between rolled fingerprints from the same source and similarities in appearance between rolled fingerprints from different sources. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

19.5 Written Test – 19.0

_____ _____ _____ _____
Trainee Trainer Date Grade

20.0 Tip and Edge Exemplar Fingerprints

20.1 Background and Theory

This portion of the training program includes the exploration of clear, fragmentary exemplar fingerprints from the tips and edges of the fingers and the comparison of fragmentary fingerprints to rolled exemplar fingerprints. The fragmentary fingerprints bear limited or no focal points, reflect natural touches of a surface, and meet suitability criteria.

20.2 Objectives, Principles, and Knowledge

20.2.1 The trainee shall be able to describe the size and shape (outline) of fragmentary fingerprints.

20.2.2 The trainee shall be able to predict the distal orientation of fragmentary fingerprints, consider the uncertainty of the prediction, and support the decision.

20.2.3 The trainee shall be able to predict left/right handedness of fragmentary fingerprints, consider the uncertainty of the prediction, and support the decision.

20.2.4 The trainee shall be able to select effective target data in fragmentary fingerprints.

20.2.5 The trainee shall be able to compare fragmentary fingerprints to rolled fingerprints and interpret the observed data to include or exclude possible candidates.

20.2.6 The trainee shall be able to determine when additional exemplars are required to complete a comparison.

20.2.7 The trainee shall be able to evaluate the similarities and dissimilarities (variations in appearance) between fingerprints from the same source.

20.2.8 The trainee shall be able to evaluate dissimilarities and coincidental similarities between fingerprints from different sources.

20.2.9 The trainee shall be able to support the conclusion with the appropriate weighting of observed data.

20.3 Health and Safety Hazards

20.3.1 N/A

20.4 Reading and Practical Exercises

20.4.1 Practical Exercise I – Trainee will discuss with their trainer the size and shapes of fingerprint tips and edge prints and what information in them may be useful in assessing location and orientation. Pass/Fail.

_____ _____ _____

Trainee Trainer Date

20.4.2 Practical Exercise II – Obtain packet from your trainer. Note the distal orientation of the provided prints and if they are most likely to be from the right or left hand. Passing score is 90%.

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

20.4.3 Practical Exercise III - Complete Comparison Packet B as assigned by the Trainer. Passing score is 100% - exercises will be returned to the trainee until all answers are correct.

_____	_____	_____
Trainee	Trainer	Date

20.5 Written Test – 20.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

21.0 Full and Partial Exemplar Proximal and Middle Phalange Prints

21.1 Background and Theory

This portion of the training program includes the exploration of full and partial exemplar recordings of the proximal and middle portions of the fingers and the comparison of full and partial exemplar impressions of the proximal and middle portions of the fingers. Impressions will include the friction ridge features, the significance of observed data, reflect natural touches of a surface, and meet suitability criteria.

21.2 Objectives, Principles, and Knowledge

21.2.1 The trainee shall be able to describe the size and shape (outline) of rolled impressions of the proximal and middle phalanges.

21.2.2 The trainee shall be able to identify major ridge flows in rolled impressions of the proximal and middle phalanges.

21.2.3 The trainee shall be able to identify the flexion creases and secondary creases in rolled impressions of the proximal and middle phalanges.

21.2.4 The trainee shall be able to recognize the distal orientation of rolled impressions of the proximal and middle phalanges.

21.2.5 The trainee shall be able to distinguish between impressions of the proximal phalange and the middle phalange.

21.2.6 The trainee shall be able to describe the challenges associated with assigning distal orientation and distinguishing proximal phalange from middle phalange.

21.2.7 The trainee shall be able to compare rolled impressions of the proximal and middle phalanges, declare a match or non-match, and articulate the basis for the match or non-match (e.g., similarities or dissimilarities in ridge flows, crease shape, scars, and ridge arrangements).

21.2.8 The trainee shall be able to discuss the variation in appearance (dissimilarities) between rolled proximal and middle phalange impressions from the same source.

21.2.9 The trainee shall be able to discuss coincidental similarities in appearance between rolled proximal and middle phalange impressions from different sources.

21.2.10 The trainee shall be able to describe the size and shape (outline) of partial impressions of the proximal and middle phalanges.

21.2.11 The trainee shall be able to predict the distal orientation of partial impressions of the proximal and middle phalanges, consider the uncertainty of the prediction, and support the decision.

21.2.12 The trainee shall be able to predict left/right handedness of partial impressions of the proximal and middle phalanges, consider the uncertainty of the prediction, and support the decision.

21.2.13 The trainee shall be able to select effective target data in partial impressions of the proximal and middle phalanges.

21.2.14 The trainee shall be able to compare partial impressions of the proximal and middle phalanges to rolled impressions of the proximal and middle phalanges and interpret the observed data to include or exclude possible candidates.

21.2.15 The trainee shall be able to determine when additional exemplars are required to complete a comparison.

21.2.16 The trainee shall be able to evaluate the similarities and dissimilarities (variations in appearance) between proximal and middle phalange prints from the same source.

21.2.17 The trainee shall be able to evaluate the dissimilarities and coincidental similarities between proximal and middle phalange prints from different sources.

21.2.18 The trainee shall be able to support the conclusion with the appropriate weighting of observed data.

21.3 Health and Safety Hazards

21.3.1 N/A

21.4 Reading and Practical Exercises

21.4.1 Complete 21.0 Reading List.

_____ _____ _____
Trainee Trainer Date

21.4.2 Practical Exercise I – Obtain packet from your trainer. Trace the ridge flows in the provided impressions. Discuss the patterns you see with your trainer. How can these patterns be used to predict location during the comparison process and how certain can you be in your predictions? Pass/Fail.

_____ _____ _____
Trainee Trainer Date

21.4.3 Practical Exercise II – Obtain packet from your trainer. Note the distal orientation of the provided prints and if they are most likely to be from the right or left hand. Passing score is 90%.

_____ _____ _____ _____
Trainee Trainer Date Grade

21.4.4 Practical Exercise III – Complete Comparison Packet C as assigned by the Trainer. Passing score is 100% - exercises will be returned to the trainee until all answers are correct.

_____ _____ _____
Trainee Trainer Date

21.5 Written Test – 21.0

_____ _____ _____ _____
Trainee Trainer Date Grade

22.0 Full and Partial Exemplar Palm Prints

22.1 Background and Theory

This portion of the training program includes the exploration of full and partial exemplar recordings of the palms. Impressions will include the friction ridge features, the significance of observed data, reflect natural touches of a surface, and meet suitability criteria.

22.2 Objectives, Principles, and Knowledge

22.2.1 The trainee shall be able to identify the interdigital, thenar, and hypothenar regions of left and right palms.

22.2.2 The trainee shall be able to describe size and shape (outline) of full palm prints.

22.2.3 The trainee shall be able to distinguish left palms from right palms.

22.2.4 The trainee should be able to recall the frequency of arch, loop, whorl, column, and vestige patterns in each region of the palm.

22.2.5 The trainee should be able to describe the common positions and shapes of the deltas in each region of the palm.

22.2.6 The trainee should be able to describe the range of variation in the number and positions of deltas in each region of the palm.

22.2.7 The trainee should be able to describe the relationship of deltas and patterns in each region of the palm.

22.2.8 The trainee shall be able to describe the major ridge flows commonly associated with each region of the palm.

22.2.9 The trainee shall be able to describe the location, orientation, and densities of the flexion creases and secondary creases typically associated with each region of the palm.

22.2.10 The trainee shall be able to describe the typical size and shape of impressions from each region of the palm.

22.2.11 The trainee shall be able to predict the palm sub-region(s) of partial palm prints, consider the uncertainty of the prediction, and support the decision.

22.2.12 The trainee shall be able to predict left/right handedness of partial palm prints, consider the uncertainty of the prediction, and support the decision.

22.2.13 The trainee shall be able to predict the distal orientation of partial palm prints, consider the uncertainty of the prediction, and support the decision.

22.2.14 The trainee shall be able to select effective target data in partial palm prints.

22.2.15 The trainee shall be able to compare partial palm prints to full palm prints and interpret the observed data to include or exclude possible candidates.

22.2.16 The trainee shall be able to determine when additional exemplars are required to complete a comparison.

22.2.17 The trainee shall be able to evaluate the similarities and dissimilarities (variations in appearance) between palm prints from the same source.

22.2.18 The trainee shall be able to evaluate the dissimilarities and coincidental similarities between palm prints from different sources.

22.2.19 The trainee shall be able to support the conclusion with the appropriate weighting of observed data.

22.3 Health and Safety Hazards

22.3.1 N/A

22.4 Reading and Practical Exercises

22.4.1 Complete 22.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

22.4.2 Practical Exercise I – Obtain packet from your trainer. Trace the ridge flows in the provided impressions. Discuss the patterns you see with your trainer. How can these patterns be used to predict location during the comparison process and how certain can you be in your predictions? Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

22.4.3 Practical Exercise II – Obtain packet from your trainer. Note the distal orientation of the provided prints and if they are most likely to be from the right or left hand. Passing score is 90%.

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

22.4.4 Practical Exercise III – Complete Comparison Packet D as assigned by the Trainer. Passing score is 100% - exercises will be returned to the trainee until all answers are correct.

_____	_____	_____
Trainee	Trainer	Date

22.5 Written Test – 22.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

23.0 Full and Partial Exemplar Foot Prints

23.1 Background and Theory

This portion of the training program includes the exploration of full and partial exemplar recordings of the feet. Impressions will include the friction ridge features, the significance of observed data, reflect natural touches of a surface, and meet suitability criteria.

23.2 Objectives, Principles, and Knowledge

23.2.1 The trainee shall be able to identify the toes, hallucal, interdigital, thenar (proximal and distal) and hypothenar (proximal and distal) and calcar regions of left and right feet.

23.2.2 The trainee shall be able to describe size and shape (outline) of full foot prints.

23.2.3 The trainee shall be able to distinguish left feet from right feet.

23.2.4 The trainee should be able to recall the frequency of arch, loop, whorl, column, and vestige patterns in each region of the foot.

23.2.5 The trainee should be able to describe the common positions of the deltas in each region of the foot.

23.2.6 The trainee should be able to describe the range of variation in the number and positions of deltas in each region of the foot.

23.2.7 The trainee should be able to describe the relationship of deltas and patterns in each region of the foot.

23.2.8 The trainee shall be able to describe the major ridge flows commonly associated with each region of the foot.

23.2.9 The trainee shall be able to describe the location, orientation, and densities of the flexion creases and secondary creases typically associated with each region of the foot.

23.2.10 The trainee shall be able to describe the typical size and shape of impressions from each region of the foot.

23.2.11 The trainee shall be able to predict the foot sub-region(s) of partial foot prints, consider the uncertainty of the prediction, and support the decision.

23.2.12 The trainee shall be able to predict left/right determinations of partial foot prints, consider uncertainty of the prediction, and support the decision.

23.2.13 The trainee shall be able to predict the distal orientation of partial foot prints, consider the uncertainty of the prediction, and support the decision.

23.2.14 The trainee shall be able to distinguish partial palm prints from partial foot prints and appropriately assign uncertainty to the determination of palm or foot.

23.2.15 The trainee shall be able to select effective target data in partial foot prints.

23.2.16 The trainee shall be able to compare partial foot prints to full foot prints and interpret the observed data to include or exclude possible candidates.

23.2.17 The trainee shall be able to determine when additional exemplars are required to complete a comparison.

23.2.18 The trainee shall be able to evaluate the similarities and dissimilarities (variations in appearance) between foot prints from the same source.

23.2.19 The trainee shall be able to evaluate the dissimilarities and coincidental similarities between foot prints from different sources.

23.2.20 The trainee shall be able to support the conclusion with the appropriate weighting of observed data.

23.3 Health and Safety Hazards

23.3.1 N/A

23.4 Reading and Practical Exercises

23.4.1 Complete 23.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

23.4.2 Practical Exercise I – Obtain packet from your trainer. Trace the ridge flows in the provided impressions. Discuss the patterns you see with your trainer. How can these patterns be used to predict location during the comparison process and how certain can you be in your predictions? Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

23.4.3 Practical Exercise II – Obtain packet from your trainer. Note the distal orientation of the provided prints and if they are most likely to be from the right or left foot. Passing score is 90%.

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

23.4.4 Practical Exercise III – Complete Comparison Packet E as assigned by the Trainer. Passing score is 100% - exercises will be returned to the trainee until all answers are correct.

_____	_____	_____
Trainee	Trainer	Date

23.5 Written Test – 23.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

24.0 Recording Fingerprints, Palm Prints, and Foot Prints

24.1 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.

This portion of the training program includes the methods used by ISPFS and submitting agencies for the collection of exemplar prints from intact friction ridge skin and the challenges and limitations associated with each method. The level of instruction and level of comprehension of the trainee is dependent on the job requirements.

24.2 Objectives, Principles, and Knowledge

24.2.1 The trainee shall be able to recognize the different methods of collecting exemplar prints (e.g., printer's ink, adhesive lifters (Handiprint®), and digital capture (Livescan)).

24.2.2 The trainee shall be able to describe the basic process for each method of collecting exemplar prints for fingers, palms, and feet.

24.2.3 The trainee shall be able to describe the typical sources of distortion for each method (e.g., over-inking, under-inking, too much pressure, too little pressure, overlays/double touches, slippage, smearing, and stitching errors, digital artifacts).

24.2.4 The trainee shall be able to determine when exemplar prints should not be used for comparison (e.g., poor resolution).

24.2.5 The trainee shall be able to list the necessary documentation when obtaining exemplar prints.

24.2.6 The trainee shall be able to collect standard exemplar prints of the fingers, palms, and feet using each method approved by ISPFS.

24.2.7 The trainee shall be able to collect complete friction ridge exemplars (major case prints) of the fingers, palms, and feet using each method approved by ISPFS.

24.3 Health and Safety Hazards

24.3.1 N/A

24.4 Reading and Practical Exercises

24.4.1 Complete 24.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

24.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 3.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

24.4.3 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

24.4.4 Practical Exercise III – Taking Major Case Prints (with ink) - Instruction by Trainer followed by hands-on application. Trainee will produce at least one full set to include (full palms, sides of palms, full lengths of fingers (rolled and flat), fingertip prints (rolled up and side-to-side). Exemplars will be evaluated by and discussed with the Trainer. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

24.4.5 Practical Exercise IV – Black Powder Adhesive Lift Method (major case prints and footprints) - Instruction by Trainer followed by hands-on application. Trainee will produce at least one full set to include (full palms, sides of palms, full lengths of fingers (rolled and flat), fingertip prints (rolled up and side-to-side). Exemplars will be evaluated by and discussed with the Trainer. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

24.4.6 Practical Exercise V – Livescan Terminal Familiarity – Overview led by a BCI Livescan terminal operator. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

24.5 Written Test – Module 24

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

25.0 Introduction to Logic and Reasoning

25.1 Background and Theory

This portion of the training program includes an introduction to logic, reasoning, and human factors as it pertains to the examination of friction ridge impressions.

25.2 Objectives, Principles, and Knowledge

25.2.1 The trainee shall be able to explain how inferences are formed using deductive, inductive, and abductive logic.

25.2.2 The trainee shall be able to describe circumstances in which deductive, inductive, and abductive logic are utilized to make inferences.

25.2.3 The trainee should be able to evaluate the strengths and limitations of the different forms of logic used to make inferences.

25.2.4 The trainee should be able to evaluate the benefits and limitations of reporting discrete examination conclusions.

25.2.5 The trainee should be able to evaluate the benefits and limitations of reporting continuous statistical conclusions (posterior probabilities, likelihood ratio, Bayes factor, and conditional match probability).

25.2.6 The trainee should be able to recognize fallacies of logic, faulty reasoning, circular reasoning, transposing the conditional, prosecutor's fallacy, and appeal to authority.

25.3 Health and Safety Hazards

25.3.1 N/A

25.4 Reading and Practical Exercises

25.4.1 Complete 25.0 Reading List.

_____ _____ _____

Trainee Trainer Date

25.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 3.0. 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 –Discuss with your trainer the benefits and limitations of reporting discrete examination conclusions versus continuous statistical conclusions. Pass/Fail.

_____ _____ _____

Trainee Trainer Date

25.5 Written Test – 25.0

_____ _____ _____ _____

Trainee Trainer Date Grade

26.0 Visual Interpretation of Ridge Detail in Latent Prints: Residue

26.1 Background and Theory

This portion of the training program includes the visual effects of the following on the appearance of friction ridge features in friction ridge impressions: the types of residue (sebaceous secretions, eccrine sweat, combined sebaceous and eccrine sweat, and blood) commonly found on the friction ridge skin; variations in the distribution of residue on the skin; and the deposition of the residue onto surfaces.

26.2 Objectives, Principles, and Knowledge

26.2.1 The trainee should be able to recognize the effects various residues can have on the appearance of latent prints.

26.2.2 The trainee should be able to describe potential variations in the distribution of residue on the surface of the skin.

26.2.3 The trainee should be able to explain how the residue is deposited onto a surface and how the distribution of the residue on the skin impacts the manner in which the residue is deposited.

26.2.4 The trainee should be able to predict the appearance of the contact regions (e.g., tops of the ridges) and non-contact regions (e.g., furrows, creases, and wrinkles) of the skin given the different ways the residue can be distributed on the surface of the skin.

26.3 Health and Safety Hazards

26.3.1 N/A

26.4 Reading and Practical Exercises

26.4.1 Complete 26.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

26.4.2 Practical Exercise I –Make a series of prints (variety of pressures, angles of touch, amount of matrix) on a clean piece of glass using natural matrices. Powder process and lift to observe the variation. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

26.4.3 Practical Exercise II –Make a series of prints (variety of pressures, angles of touch, amount of matrix) on a clean piece of glass using an oily, greasy, and/or waxy matrix. Powder process and lift to observe the variation. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

26.4.4 Practical Exercise III –Make a series of prints (variety of pressures, angles of touch, amount of matrix) on a clean piece of glass using a wet matrix. Allow to dry and powder process and lift to observe the variation. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

26.5 Written Test – 26.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

27.0 Visual Interpretation of Ridge Detail in Latent Prints: Contact

27.1 Background and Theory

The training program shall include the visual effects of the following on the appearance of friction ridge features in friction ridge impressions: variations in deposition pressure when the skin contacts surface; movement of the skin on the surface and the redistribution of residue onto a surface; changes in deposition pressure as the skin moves on the surface; and combined residue and touch factors.

27.2 Objectives, Principles, and Knowledge

27.2.1 The trainee should be able to recognize global deposition pressure based on the size and shape of impressions and the nature of the surface touched.

27.2.2 The trainee should be able to recognize local variations in deposition pressure within one contact with the surface (i.e., within one impression) based on the ridge and furrow dimensions.

27.2.3 The trainee should be able to explain localized deposition pressures within one contact of the surface due to the anatomy of the hand or foot and the nature of the surface touched.

27.2.4 The trainee should be able to predict the variation in appearance of the ridges and furrows throughout an impression due to localized deposition pressures and variations in residue distribution on the skin.

27.2.5 The trainee should be able to define the following terms related to skin contact with a surface: stick region, incipient slip, and gross slip.

27.2.6 The trainee shall be able to describe the visual cues that indicate the skin moved laterally (sheering stress) or twisted (torque) on porous and non-porous surfaces.

27.2.7 The trainee should be able to describe how the residue is redistributed on the surface when the skin experiences incipient slip or gross slip.

27.2.8 The trainee should be able to predict the variation in the appearance of the ridges and furrows throughout an impression due to the redistribution of the residue on the surface during incipient slip or gross slip.

27.2.9 The trainee shall be able to describe the visual cues (e.g., misaligned ridges and furrows) that indicate the skin changed pressure during an incipient slip or gross slip.

27.2.10 The trainee shall be able to describe the visual cues that skin made multiple contacts with a surface (e.g., interference patterns).

27.3 Health and Safety Hazards

27.3.1 N/A

27.4 Reading and Practical Exercises

27.4.1 Complete 27.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

27.4.2 Practical Exercise I –Make a series of finger and palm prints (Sirchie pad) using a variety of pressures on a flat surface. Powder process and lift to observe the variation. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

27.4.3 Practical Exercise II –Make a series of prints incorporating horizontal slipping, vertical slipping, and twisting on a flat surface. Powder process and lift to observe the variation. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

27.5 Written Test – 27.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

28.0 Visual Interpretation of Ridge Detail in Latent Prints: Surfaces

28.1 Background and Theory

This portion of the training program includes the visual effects of the following on the appearance of friction ridge features in friction ridge impressions: deformation of the friction ridge skin with commonly touched surfaces (e.g. flat versus curved surfaces); the interaction of friction ridge skin residue with commonly touched surfaces; the introduction of background noise by textured surfaces; the introduction of background noise by surface contaminants; the interaction of latent print residue with surface contaminants; and combined residue, touch and surface factors.

28.2 Objectives, Principles, and Knowledge

28.2.1 The trainee shall be able to explain how the shape of surfaces touched can affect the appearance of friction ridge impressions (e.g., flat and contoured surfaces).

28.2.2 The trainee shall be able to explain how the firmness of surfaces touched can affect the appearance of friction ridge impressions.

28.2.3 The trainee shall be able to explain how the texture of surfaces touched can affect the appearance of friction ridge impressions.

28.2.4 The trainee shall be able to explain how interactions of latent print residues with typical surfaces can affect the appearance of friction ridge impressions.

28.2.5 The trainee shall be able to explain how interactions of latent print residues with surface contaminants can affect the appearance of friction ridge impression.

28.2.6 The trainee shall be able to explain how the displacement or removal of surface contaminants by the skin can affect the appearance of friction ridge impressions.

28.3 Health and Safety Hazards

28.3.1 N/A

28.4 Reading and Practical Exercises

28.4.1 Complete 28.0 Reading List.

_____ _____ _____
Trainee Trainer Date

28.4.2 Practical Exercise I –Make a series of finger and palm prints (Sirchie pad) using a variety of pressures on a rounded surface. Powder process and lift to observe the variation. Compare these to the prints you made in 27.4.2. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

28.4.3 Practical Exercise II –Make a series of prints incorporating horizontal slipping, vertical slipping, and twisting on the above surfaces. Powder process and lift to observe the variation. Compare these to the prints in 27.4.3. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

28.4.4 Practical Exercise III –Make a series of finger and palm prints (Sirchie pad) using a variety of pressures on a textured surface. Powder process and lift to observe the variation. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

28.4.5 Practical Exercise IV –Make a series of prints using a variety of pressures on dusty surface. Preserve to observe the variation. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

28.4.6 Practical Exercise V –Make a series prints (Sirchie pad) using a variety of pressures on a flexible surface. Powder process and lift to observe the variation. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

28.5 Written Test – 28.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

29.0 Visual Interpretation of Ridge Detail in Latent Prints: Processing Technique

29.1 Background and Theory

This portion of the training program explores processing techniques used by the ISPFS and submitting agencies. It includes the visual effects of the following on the appearance of friction ridge features in friction ridge impressions: the reaction of the processing technique to the latent print residue; the reaction of the processing technique to surface contaminants; the recovery method (e.g., type of photography or lifting); sequential processing; and combined residue, touch, surface, and processing factors.

29.2 Objectives, Principles, and Knowledge

29.2.1 The trainee shall be able to describe the general use of each processing technique used by ISPFS or submitting agencies.

29.2.2 The trainee shall be able to recognize friction ridge impressions developed with different processing techniques.

29.2.3 The trainee shall be able to explain how interactions of the processing technique with surface contaminants can affect the appearance of friction ridge impressions.

29.2.4 The trainee shall be able to explain how time and environmental conditions (from the time the impression was deposited to when it was recovered) can affect the appearance of friction ridge impressions.

29.2.5 The trainee shall be able to explain how the methods used to preserve impressions can affect the appearance of friction ridge impressions.

29.3 Health and Safety Hazards

29.3.1 N/A

29.4 Reading and Practical Exercises

29.4.1 Complete 29.0 Reading List.

_____ _____ _____
Trainee Trainer Date

29.4.2 Practical Exercise I –Go to case T0000-0001 in AdamsWeb. Make a list of the different processing techniques utilized and describe the appearance of the impressions developed with those techniques (color, fluorescence, spottiness, etc.). Pass/Fail. _____ _____ _____
Trainee Trainer Date

29.4.3 Practical Exercise II –Explain to your trainer, as you might to a jury, how surface contaminants, time, environmental conditions, development techniques, and preservation methods can affect the appearance of friction ridge impressions. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

29.5 Written Test – 29.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

30.0 Introduction to Digital Imaging

30.1 Background and Theory

The latent print section uses digital imaging software to document and digitally process friction ridge impressions. 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.

This section of the training program includes instruction on the use of the software, basic digital imaging concepts, and the latent section's approved digital processing techniques and tools.

30.2 Objectives, Principles, and Knowledge

30.2.1 The trainee shall be able to explain the following concepts and the relationships between the concepts: image resolution, file compression, image size, and file types.

30.2.2 The trainee shall be able to select the appropriate methods to digitally process friction ridge impressions.

30.2.3 The trainee shall be able to select the appropriate tools for documenting friction ridge impressions.

30.2.4 The trainee shall be able to follow procedures for saving images of friction ridge impressions.

30.2.5 The trainee shall demonstrate proficiency in the use of the current digital imaging system.

30.3 Health and Safety Hazards

30.3.1 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.

30.4 Reading and Practical Exercises

30.4.1 Complete 30.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

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

_____	_____	_____
Trainee	Trainer	Date

30.4.3 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

30.4.4 Practical Exercise II– Continue adding to the game or other activity you developed in 3.0. 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

30.5 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

30.6 Written Test – 30.0

_____ _____ _____ _____
Trainee Trainer Date Grade

31.0 Analysis

31.1 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.

This portion of the training program includes the process for detecting friction ridge features, thresholds for suitability decisions, documentation of suitable friction ridge impressions, establishment of search parameters (anatomical region, distal orientation and associated uncertainties), documentation of search parameters, and detection of forged or fabricated prints.

31.2 Objectives, Principles, and Knowledge

31.2.1 The trainee shall be able to detect the friction ridge features in friction ridge impressions under various combinations of residue, contact, surface, and processing techniques.

31.2.2 The trainee shall be able to predict the range of variation in appearance of friction ridge features (also known as “tolerance”) among friction ridge impressions from the same source under various combinations of residue, contact, surface, processing technique, and exemplar recording technique.

31.2.3 The trainee shall be able to describe how false minutiae could be created by factors associated with residue, contact, surface, and processing technique.

31.2.4 The trainee shall be able to indicate debatable minutiae.

31.2.5 The trainee shall be able to categorize friction ridge impressions as “suitable” or “not suitable” for comparison based on the significance of the observed data.

31.2.6 The trainee shall be able to support “suitable” and “not suitable” decisions per the latent section policy.

31.2.7 The trainee shall be able to explain the reasons friction ridge impressions may display debatable suitability.

31.2.8 The trainee shall be able to document suitability decisions and consultations per latent section policy.

31.2.9 The trainee shall be able to predict the anatomical region(s) represented in friction ridge impressions, consider the uncertainty of the prediction, and support the decision.

31.2.10 The trainee shall be able to predict the distal orientation of friction ridge impressions, consider the uncertainty of the prediction, and support the decision.

31.2.11 The trainee shall be able to document anatomical region, distal orientation, and associated uncertainties per latent section requirements.

31.2.12 The trainee shall be able to categorize friction ridge impressions as "suitable" or "not suitable" for MBIS (Multimodal Biometric Identification System) search based on the observed data and section requirements.

31.2.13 Trainee shall be able to support MBIS "suitable" and "not suitable" decisions.

31.2.14 Trainee shall be able to document MBIS suitability decisions per section requirements.

31.2.15 The trainee shall be able to recognize common methods of forged or fabricated friction ridge impressions.

31.3 Health and Safety Hazards

31.3.1 N/A

31.4 Reading and Practical Exercises

31.4.1 Complete 31.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

31.4.2 Practical Exercise I – watch all the video files located in I:drive/Latent Print/Papers & Training Resources/Distortion Videos Meridian. Pick one video from each of the four folders to view and discuss your observations with your trainer.

_____	_____	_____	_____
Trainee	Trainer	Date	Video #
_____	_____	_____	_____
Trainee	Trainer	Date	Video #
_____	_____	_____	_____
Trainee	Trainer	Date	Video #
_____	_____	_____	_____
Trainee	Trainer	Date	Video #

31.4.3 Practical Exercise II – Trainee will describe to their trainer, as they might a jury, the "analysis" portion of ACE, to include pattern, ridge flow, anatomical source, orientation, types of features (levels of detail), how they are documented, and the types of suitability decisions they may arrive at. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

31.4.4 Practical Exercise III – Trainee will chart ten assigned prints using AdamsWeb and Photoshop layers following the latent print analytical method. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

31.4.5 Practical Exercise IV – Obtain and complete the "Complexity of the Latent Print Exercise" from your trainer. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

31.4.6 Practical Exercise V – Trainee will document their Analysis in ILIMS for each of the prints assigned in 31.4.4 Analysis will include Latent #, Date, if orientation is known, anatomic source if known, quantity of high confidence minutiae, presence of unassessed friction ridge detail, complexity of the latent, pressure, distortion, development medium, substrate, preservation, comparison utility, MBIS utility, notes if applicable, and ILIMS stats. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

31.4.7 Practical Exercise VI - "100 Prints." Trainee will assess 100 prints as to value (insufficient ridge detail "IRD," value for exclusion only, or value for comparison) and area of origin. Passing score is 90% for these two columns. Additional columns, i.e. pattern, finger or hand to search first, complexity of the latent, 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	Grade

31.5 Written Test – 31.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

32.0 Comparison

32.1 Background and Theory

This portion of the training program includes the selection of target data in the questioned friction ridge impression, the process for searching target data through exemplar prints, and the side-by-side comparison of a questioned and exemplar print.

32.2 Objectives, Principles, and Knowledge

32.2.1 The trainee shall be able to select effective target data in the questioned friction ridge impression.

32.2.2 The trainee shall be able to search target data in questioned friction ridge impressions against exemplar friction ridge impressions and interpret the observed data to include or exclude possible candidates.

32.2.3 The trainee shall be able to determine when additional exemplars are required to complete a comparison.

32.2.4 The trainee shall be able to compare (side-by-side) questioned and exemplar friction ridge impressions and detect similarities and dissimilarities in the observed data.

32.2.5 The trainee shall be able to weigh the similarities and dissimilarities between impressions from the same source.

32.2.6 The trainee shall be able to weigh the similarities and dissimilarities between impressions from different sources.

32.2.7 The trainee shall be able to document comparisons per ISPFS requirements.

32.3 Health and Safety Hazards

32.3.1 N/A

32.4 Reading and Practical Exercises

32.4.1 Complete 32.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

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

_____	_____	_____
Trainee	Trainer	Date

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

_____	_____	_____
Trainee	Trainer	Date

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

_____	_____	_____
Trainee	Trainer	Date

32.4.5 Practical Exercise I – Trainee will describe to their trainer, as they might a jury, the “comparison” portion of ACE and how it is performed. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

32.4.6 Practical Exercise II – The trainee will explain to their trainer what a "target area" is and how it is utilized during the comparison process. Discussion will include the need/utility for using multiple target areas and how those should be selected. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

32.4.7 Practical Exercise III – Trainee will add an additional photoshop layer (target) to each of the prints assigned in 31.4.2. The trainee will designate 2-3 groups of features selected as targets and discuss these selections with their trainer. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

32.4.8 Practical Exercise IV – Obtain and complete the "Complexity of Comparison Exercise" from your trainer. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

32.4.9 Practical Exercise V - Complete Comparison Packets F & G 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 #

32.5 Written Test – 32.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

33.0 Evaluation

33.1 Background and Theory

The training program shall include the inferential process and thresholds for rendering source conclusions as required by ISPFS.

33.2 Objectives, Principles, and Knowledge

33.2.1 The trainee shall be able to formulate appropriate source conclusions.

33.2.2 The trainee shall be able to support source conclusions with the appropriate weighing of observed data per their ISPFS requirements.

33.2.3 The trainee shall be able to predict which comparisons may result in debatable conclusions and require consultation with colleagues.

33.2.4 The trainee shall be able to describe a close non-match comparison and list published examples.

33.2.5 The trainee shall be able to explain the reasons comparisons may result in debatable conclusions.

33.2.6 The trainee shall be able to document source conclusions and consultations per ISPFS requirements.

33.3 Health and Safety Hazards

33.3.1 N/A

33.4 Reading and Practical Exercises

33.4.1 Complete 33.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

33.4.2 Practical Exercise I – Trainee will describe to their trainer, as they might a jury, the "evaluation" portion of ACE, what conclusions are available to them with the expanded conclusion scale and significance of each of the conclusions. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

33.4.3 Practical Exercise II - Complete Comparison Packets H, I, & J 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 #

33.5 Written Test – 33.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

34.0 Case Management and Reporting for Comparison and/or MBIS

34.1 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 and charts or markups are done through the digital imaging system. All case documentation should be such that another qualified Latent Print Examiner could interpret the results and/or replicate the work. MBIS searches are also documented in ILIMS with supporting documentation attached so that they too may be evaluated by another qualified examiner.

34.2 Objectives, Principles, and Knowledge

34.2.1 Trainee shall have knowledge of and the ability to demonstrate proper procedures for maintaining chain of custody (documentation and physical control).

34.2.2 Trainee shall be able to navigate and query the various databases for location of criminal history records, fingerprint and palm print cards.

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

34.2.4 Trainee shall be able 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.

34.2.5 Trainee shall have 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.

34.3 Health and Safety Hazards

34.3.1 N/A

34.4 Reading and Practical Exercises

34.4.1 Complete 34.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

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

_____	_____	_____
Trainee	Trainer	Date

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

_____	_____	_____
Trainee	Trainer	Date

34.4.4 Practical Exercise II – Writing latent print comparison reports in ILIMS – Trainer led discussion and demonstration. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

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

_____ _____ _____
Trainee Trainer Date

34.5 Written Test – 34.0

_____ _____ _____ _____
Trainee Trainer Date Grade

34.6 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

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

_____ _____ _____
Trainee Trainer Date

35.0 Court Procedures, Related Laws, Expert Testimony, Criminal and Civil Procedures Applicable to Latent Prints

35.1 Background and Theory

Admissibility of Expert Testimony - The training program shall include the history of expert testimony in the friction ridge discipline; applicable federal, state, and local rules for expert opinion testimony; the purpose of motions *in limine* to exclude expert testimony; the process and purpose of evidentiary hearings; and common regional challenges to the admissibility of friction ridge evidence.

Responsibilities of the Expert Witness -The training program shall include expectations of the expert witness in responding to subpoenas, discovery and disclosure, court orders, preparation for trials or hearings, and testimony.

Qualifications - The training program shall include the presentation of education, training, and experience during testimony.

Direct Examination - The training program shall include the methods and purpose of direct examination.

Cross Examination - The training program shall include the purpose and methods of cross-examination.

Mock Trial Process - The training program shall include a mock trial process.

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 examiners 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.

35.2 Objectives, Principles, and Knowledge.

35.2.1 The trainee shall be able to recall ISPFS's requirements for responding to a subpoena.

35.2.2 The trainee shall be able to explain the importance of discovery and disclosure and describe ISPFS's requirements for responding to discovery motions and court orders (e.g., Brady/Giglio).

35.2.3 The trainee shall be able to explain the importance of a pre-trial conference with either the prosecution and/or defense, and general preparation for testimony.

35.2.4 The trainee shall be able to describe the appropriate professional attire to be worn for court.

35.2.5 The trainee shall be able to describe the layout of the courtroom and the typical location of the judge, jury, court reporter, witness, prosecution, and defendant.

35.2.6 The trainee shall be able to describe the roles of the judge, jury, court reporter, prosecution, and defense.

35.2.7 The trainee shall be able to describe the jurisdiction's rules for entering and exiting the witness stand.

35.2.8 The trainee shall be able to describe technology in the courtroom that may be used by witnesses.

35.2.9 The trainee shall be able to explain methods of effective communication with juries, judges, and attorneys.

35.2.10 The trainee shall be able to explain the importance of appropriate courtroom demeanor and etiquette.

35.2.11 The trainee shall be able to describe the appropriate response when an objection is raised.

35.2.12 The trainee shall be able to describe the jurisdiction's process for referring to notes, reports, or other materials.

35.2.13 The trainee shall be able to explain the implications of social media on the credibility of expert witnesses.

35.2.14 The trainee shall be able to prepare a curriculum vitae (CV).

35.2.15 The trainee shall be able to recite their formal education (e.g., university and degree obtained).

35.2.16 The trainee shall be able to describe the training program they have completed and explain the significance of the training program.

35.2.17 The trainee shall be able to recite the title and general description of any relevant formal training courses completed.

35.2.18 The trainee shall be able to describe any memberships to professional organizations and the significance of those memberships.

35.2.19 The trainee shall be able to describe any professional certifications available and the significance of those certifications.

35.2.20 The trainee shall be able to describe casework experience in friction ridge examinations.

35.2.21 The trainee shall be able to explain the importance of accurately describing qualifications and the legal implications of misrepresenting education, training, or experience.

35.2.22 The trainee shall be able to explain how an expert's qualifications may be challenged under cross-examination.

35.2.23 The trainee shall be able to describe the types of testimony experts are allowed to provide.

35.2.24 The trainee shall be able to explain the difference between facts and opinions (inferences).

35.2.25 The trainee should be able to explain the concept of "ultimate issue" and limitations of expert testimony on ultimate issues in a case.

35.2.26 The trainee shall be able to explain the importance of testifying within their expertise and the possible consequences of testifying beyond their expertise.

35.2.27 The trainee shall be able to explain the importance of chain of custody of evidence.

35.2.28 The trainee should be able to recognize the general process attorneys use to develop, promote, and employ their theory of a case and the expert witness's ethical obligation to stay within the supportable bounds of their discipline during testimony.

35.2.29 The trainee shall be able to recognize possible limitations of testimony in their jurisdiction related to the Confrontation Clause of the Sixth Amendment of the United States Constitution.

35.2.30 The trainee shall be able to formulate responses to references in the friction ridge discipline commonly used during questioning.

35.2.31 The trainee shall be able to describe what a "leading question" is and how leading questions are used during cross-examination.

35.2.32 The trainee should be able to recognize general cross-examination methods used to control the testimony of the witness and the witness's ethical obligation to maintain accuracy and transparency during testimony.

35.2.33 The mock trial process shall incorporate qualifying questions, case specific direct examination, and case specific cross-examination. It may also include Voir dire or evidentiary hearing direct and cross examination. Mock trials shall support the following learning objectives:

35.2.33.1 The trainee shall be able to follow appropriate professional attire for court.

35.2.33.2 The trainee shall be able to display appropriate demeanor and etiquette.

35.2.33.3 The trainee shall be able to communicate effectively with juries, judges, and attorneys.

35.2.33.4 The trainee shall be able to respond appropriately to objections.

35.2.33.5 The trainee shall be able to follow the appropriate process when referring to notes, reports, or other materials.

35.2.33.6 The trainee shall be able to articulate their qualifications (education, training, experience, professional organizations, and certifications as applicable).

35.2.33.7 The trainee shall be able to articulate the method for receiving evidence and requests for examinations.

35.2.33.8 The trainee shall be able to articulate ISPFS's evidence handling (including chain of custody) and marking procedures.

35.2.33.9 The trainee shall be able to articulate the manner in which the three-dimensional features of the skin transfer information about the skin to a two-dimensional impression.

35.2.33.10 The trainee shall be able to articulate the factors that affect the quantity and clarity of friction ridge impressions.

35.2.33.11 The trainee shall be able to articulate the types and significance of the friction ridge skin features that can be transferred to a surface.

35.2.33.12 The trainee shall be able to articulate the basis for the discriminating power of the features of the friction ridge skin using concepts from the embryological development, findings of twin studies, findings of statistical models, and empirical observations.

35.2.33.13 The trainee shall be able to articulate the basis for the persistent nature of the features of the friction ridge skin using the structure and physiology of the skin and empirical observations.

35.2.33.14 The trainee shall be able to articulate the analysis process and the basis for suitability and search parameter decisions.

35.2.33.15 The trainee shall be able to articulate the selection of target data, the observed data that guides the comparison process, and the weighting of similarities and dissimilarities.

35.2.33.16 The trainee shall be able to articulate the possible source conclusions that can be rendered after comparison, the inferential process for rendering source conclusions, and thresholds for rendering source conclusions.

35.2.33.17 The trainee shall be able to articulate the basis for categorical conclusions.

35.2.33.18 The trainee shall be able to articulate the strengths and limitations of categorical conclusions or statistical results.

35.2.33.19 The trainee shall be able to articulate the significance of the studies comparing novices to trained friction ridge examiners.

35.2.33.20 The trainee shall be able to articulate the significance of the studies evaluating error rates of trained friction ridge examiners.

35.2.33.21 The trainee shall be able to articulate the significance of human factors in examiner performance and the quality assurance processes in place to improve performance.

35.2.33.22 The trainee shall be able to articulate facts and inferences within the supportable bounds of the friction ridge examination discipline.

35.2.34 The mock trial process shall include formal and specific feedback for the trainee after completion of each mock trial.

35.3 Health and Safety Hazards

35.3.1 N/A

35.4 Reading and Practical Exercises

35.4.1 Complete 35.0 Reading List.

	_____ Trainee	_____ Trainer	_____ Date

35.4.2 The Trainee should attend a courtroom testimony training class when available (attach copy of certificate).

	_____ Trainee	_____ Trainer	_____ Date

35.4.3 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

35.4.4 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

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

	_____ Trainee	_____ Trainer	_____ Date

35.4.6 Practical Exercise IV – Prepare a list of court qualifying questions related to latent print processing or comparison or MBIS and provide sample answers to those questions. Pass/Fail.

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

35.4.7 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

35.4.8 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 examiner 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

35.4.9 Practical Exercise VII -Trainee shall attend the testimony of two forensic scientists. Pass/Fail.

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

35.4.10 Practical Exercise VIII – 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

35.4.11 Practical Exercise IX - 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 trainee will utilize a comparison chart of their own making during the comparison mock court. Pass/Fail.

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

35.5 Written Test – 35.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

36.0 Introduction to Error Rate Calculations and Confidence Intervals

36.1 Background and Theory

This portion of the training program includes an overview of error rate testing, methods, and limitations of calculating error rates, the application of confidence intervals to error rates. Additionally, the training program includes the concepts of admissibility, "foundational validity," and "validity as applied" with respect to pattern evidence.

36.2 Objectives, Principles, and Knowledge

36.2.1 The trainee shall be able to explain the purpose of error rate testing of friction ridge examiners.

36.2.2 The trainee shall be able to define the following concepts related to error rate testing: accuracy, reproducibility, repeatability, and reliability.

36.2.3 The trainee should be able to recognize the following conditional probabilities with respect to the results of error rate testing: sensitivity, specificity, false positive rate, false negative rate, positive predictive value, negative predictive value, false positive discovery rate, and false negative discovery rate.

36.2.4 The trainee shall be able to recite the application of confidence intervals to the results of error rate testing.

36.2.5 The trainee shall be able to recite the significance of confidence intervals as they pertain to error rate testing.

36.2.6 The trainee shall be able to recite "foundational validity" and "validity as applied" as discussed in the 2016 President's Council of Advisor's on Science and Technology (PCAST) report, Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature Comparison Methods.

36.3 Health and Safety Hazards

36.3.1 N/A

36.4 Reading and Practical Exercises

36.4.1 Complete 36.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

36.4.2 Practical Exercise I– Continue adding to the game or other activity you developed in 3.0. 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

36.4.3 Practical Exercise II – Write one paragraph summing up the findings for the following performance studies: the FBI black box study, the Miami Dade, and the palm print black box study. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

36.4.4 Practical Exercise III – Obtain and complete the Error Rate Calculation Exercise from your trainer. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

36.4.5 Practical Exercise IV – Explain "foundational validity" and "validity as applied" to your trainer. What is a "confidence interval?" Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

36.5 Written Test – 36.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

37.0 Expert Versus Novice Studies

37.1 Background and Theory

This portion of the training program includes the results, significance, and limitations of published research evaluating the differences between the performance of novices and trained friction ridge examiners (experts).

37.2 Objectives, Principles, and Knowledge

37.2.1 The trainee should be able to explain the differences novices and experts display during the analysis of friction ridge impressions.

37.2.2 The trainee should be able to explain the differences novices and experts display during the comparison of friction ridge impressions.

37.2.3 The trainee shall be able to explain the differences novices and experts display during the evaluation of friction ridge impressions.

37.2.4 The trainee shall be able to evaluate the strengths and limitations of the studies comparing novices to experts.

37.2.5 The trainee shall be able to assess the value of training for the examination of friction ridge impressions.

37.2.6 The trainee shall be able to support the use of trained examiners for rendering of source conclusions for friction ridge impressions with findings from the novice versus expert studies.

37.3 Health and Safety Hazards

37.3.1 N/A

37.4 Reading and Practical Exercises

37.4.1 Complete 37.0 Reading List.

_____ _____ _____
Trainee Trainer Date

37.4.2 Practical Exercise I– Continue adding to the game or other activity you developed in 3.0. 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

37.4.3 Practical Exercise II –Discuss with your trainer the importance of examiner training with regard latent print examination. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

37.5 Written Test – 37.0

_____ _____ _____ _____
Trainee Trainer Date Grade

38.0 Expert Studies

38.1 Background and Theory

This portion of the training program includes the results, significance, and limitations of published studies evaluating the performance of trained friction ridge examiners.

38.2 Objectives, Principles, and Knowledge

38.2.1 The trainee should be able to describe the general design of published performance studies.

38.2.2 The trainee should be able to evaluate the strengths and limitations of the performance studies.

38.2.3 The trainee should be able to explain the error rate findings from the performance studies.

38.2.4 The trainee should be able to consider reasons for variation in examiner suitability decisions in the performance studies.

38.2.5 The trainee should be able to consider reasons for variation in examiner conclusions in the performance studies.

38.2.6 The trainee should be able to consider reasons for variation in examiner mark-up of images in the performance studies.

38.2.7 The trainee should be able to assess the ability to infer casework error rates from error rate studies.

38.2.8 The trainee should be able to consider the challenges of calculating error rates from casework.

38.2.9 The trainee should be able to support the use of trained examiners in the rendering of source conclusions for friction ridge impressions with findings from the examiner performance studies.

38.3 Health and Safety Hazards

38.3.1 N/A

38.4 Reading and Practical Exercises

38.4.1 Complete 38.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

38.4.2 Practical Exercise I– Continue adding to the game or other activity you developed in 3.0. 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

38.4.3 Practical Exercise II –Discuss with your trainer the difference between intra-examiner studies and inter-examiner studies. How does this relate to latent print markups during analysis and sufficiency decisions? Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

38.4.4 Practical Exercise III – Discuss with your trainer whether or not it is possible to calculate error rates from case work. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

38.5 Written Test – 38.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

39.0 Human Factors

39.1 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) Office of Law Enforcement Standards (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.

This portion of the training program includes significant human factors that may impact the performance of examiners. The training program includes factors from the following four realms listed in the 2012 Expert Working Group on Human Factors in the Analysis of Latent Prints report, Latent Print Examination and Human Factors - Improving Practice through a Systems Approach: analyst actions, analyst conditions, supervisory issues, and organizational issues.

39.2 Objectives, Principles, and Knowledge

39.2.1 The trainee should be able to describe decision-based mistakes that could be made by an examiner.

39.2.2 The trainee should be able to describe skill-based mistakes that could be made by an examiner.

39.2.3 The trainee should be able to describe perception-based mistakes that could be made by an examiner.

39.2.4 The trainee should be able to describe violations that could be committed by an examiner.

39.2.5 The trainee should be able to discuss the adverse mental states that could affect examiner performance.

39.2.6 The trainee should be able to discuss the adverse physiological states that could affect examiner performance.

39.2.7 The trainee should be able to explain how communication could affect examiner performance.

39.2.8 The trainee should be able to discuss the physical or mental limitations that could affect examiner performance.

39.2.9 The trainee should be able to explain how the technical environment could affect examiner performance.

39.2.10 The trainee should be able to explain how the physical environment could affect examiner performance.

39.2.11 The trainee should be able to discuss the supervisory leadership failures that could affect examiner performance.

39.2.12 The trainee should be able to explain how a supervisor's failure to correct known problems could affect examiner performance.

39.2.13 The trainee should be able to discuss the supervisory operational planning failures that could affect examiner performance.

39.2.14 The trainee should be able to discuss the supervisory violations that could affect examiner performance.

39.2.15 The trainee should be able to discuss organizational resource management failures that could affect examiner performance.

39.2.16 The trainee should be able to explain how an FSP's operational processes could affect examiner performance.

39.2.17 The trainee should be able to explain how the organization's climate could affect examiner performance.

39.2.18 The trainee should be able to discuss potential human factors associated with errors in cases such as: John Orr (1991), Shirley McKie (1999), Mark Miller (2001), Brandon Mayfield (2004), Dexter Presnell (2005), Lana Canen (2012) and Alton Dandridge (2015).

39.2.19 The trainee should be able to discuss the potential human factors associated with forgery and fabrication cases such as: William DePalma (fabrication 1967), Herman Wiggins (fabrication 1970's), NY State Troop "C" (fabrication 1989), Frederik van der Vyver (fabrication 2005), and Peter Paul Biro (Jackson Pollack forgery 2008).

39.2.20 The trainee should be able to describe cognitive bias and list the major studies and their applicability to friction ridge examinations.

39.3 Health and Safety Hazards

39.3.1 N/A

39.4 Reading and Practical Exercises

39.4.1 Complete 39.0 Reading List.

_____ _____ _____
Trainee Trainer Date

39.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 3.0. 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

39.4.3 Practical Exercise II – Write a short paper (2-3 pages) explaining human factors as they relate to latent print examination. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

39.4.4 Practical Exercise III – Discuss with your trainer the difference between forgery and fabrication and how you might be able to detect this in casework. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

39.4.5 Practical Exercise IV – Explain to your trainer what bias is and if it can be overcome. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

39.5 Written Test – 39.0

_____ _____ _____ _____
Trainee Trainer Date Grade

40.0 Quality Assurance

40.1 Background and Theory

This portion of the training program includes the quality assurance processes adopted by ISPFS to improve the performance of the examiners.

40.2 Objectives, Principles, and Knowledge

40.2.1 The trainee should be able discuss the importance of testing during the hiring process.

40.2.2 The trainee should be able discuss the importance of testing during the training program.

40.2.3 The trainee shall be able discuss the importance of competency testing at the completion of training.

40.2.4 The trainee shall be able to describe the frequency, purpose, and importance of proficiency testing.

40.2.5 The trainee shall be able to describe the frequency, purpose, and importance of internal audits.

40.2.6 The trainee shall be able to describe the frequency, purpose, and importance of external audits.

40.2.7 The trainee shall be able to describe method(s) of verification used by the discipline and importance and limitations of each method.

40.2.8 The trainee shall be able to describe method(s) of case review used by ISPFS and purpose of each method.

40.2.9 The trainee shall be able to describe the method(s) of testimony review used by ISPFS and purpose of the method.

40.2.10 The trainee shall be able to describe the method(s) of conflict resolution used by ISPFS and purpose of each method.

40.2.11 The trainee shall be able to describe the methods and goals of corrective actions and preventative actions used by ISPFS.

40.2.12 The trainee shall be able to explain the importance of case documentation to quality assurance.

40.2.13 The trainee shall be able to describe the methods used by ISPFS to shield the examiners from undue internal and external pressure.

40.2.14 The trainee shall be able to describe the basic process for achieving and maintaining accreditation.

40.2.15 The trainee shall be able to describe the basic process for achieving and maintaining IAI certification.

40.3 Health and Safety Hazards

40.3.1 N/A

40.4 Reading and Practical Exercises

40.4.1 Complete 40.0 Reading List.

_____ _____ _____
Trainee Trainer Date

40.4.2 Practical Exercise I - Continue adding to the game or other activity you developed in 3.0. 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

40.4.3 Practical Exercise II - Explain the difference between Competency and Proficiency testing to your trainer. Explain how often each type of testing is administered and what the goal of each type of test is. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

40.4.4 Practical Exercise III - Describe to your trainer, as you would to a jury, the different types of verification utilized as well as the advantages and limitations of each. Explain the latent print section's conflict resolution policy and describe how it utilized in case work. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

40.5 Written Test – 40.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

41.0 Laboratory Safety and Reagent Preparation

41.1 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.

41.2 Objectives, Principles, and Knowledge

41.2.1 The trainee shall be able to follow proper chemical hygiene procedures (e.g., using fume hoods and personal protective equipment) and be able to operate and maintain safety equipment (e.g., eye wash and safety showers).

41.2.2 The trainee shall be able to interpret Safety Data Sheets (SDSs).

41.2.3 The trainee shall be able to follow the requirements for documenting and labeling prepared reagents.

41.2.4 The trainee shall be able to assign expiration dates to prepared reagents per ISPFS requirements.

41.2.5 The trainee shall be able to follow requirements for the storage of chemicals and reagents.

41.2.6 The trainee shall have knowledge of spill procedures and the location of spill equipment.

41.2.7 The trainee shall be able to follow requirements for the disposal of chemicals and reagents.

41.3 Health and Safety Hazards

41.3.1 N/A

41.4 Reading and Practical Exercises

41.4.1 Complete 41.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

41.4.2 Practical Exercise I – Devise a game or other activity that will incorporate all of the key terms 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

41.4.3 Practical Exercise II - Trainer led session on section safety equipment (location of Safety Data Sheets, spill kits, eye washes, fire extinguishers); chemical storage and disposal; forms; and labeling requirements (bottle labels, hazard labels, reagent logs, equipment maintenance logs, control test logs, image deletion logs, etc.). Pass/Fail.

_____ _____ _____
Trainee Trainer Date

41.4.4 Practical Exercise III - The trainee shall demonstrate the above 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 and/or how to fill out forms. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

41.5 Written Test – 41.0

_____ _____ _____ _____
Trainee Trainer Date Grade

42.0 Equipment Maintenance and Performance Checks

42.1 Background and Theory

This portion of the training program includes the following for each piece of equipment that must be checked or maintained: method of the equipment check, frequency of checks, method of maintenance, frequency of maintenance, and documentation.

42.2 Objectives, Principles, and Knowledge

42.2.1 The trainee shall be able to check the performance of the required equipment.

42.2.2 The trainee shall be able to maintain the required equipment.

42.2.3 The trainee shall be able to document performance checks, maintenance, and service calls of the required equipment.

42.3 Health and Safety Hazards

42.3.1 N/A

42.4 Reading and Practical Exercises

42.4.1 Complete 42.0 Reading List.

_____ _____ _____
Trainee Trainer Date

42.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. 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

42.4.3 Practical Exercise II – Assist with monthly QCs. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

42.4.4 Practical Exercise III –Demonstrate to your trainer how you would check the air flow of the fume hoods, check the balance and set up the UV decontamination units in the MEGAfume. Explain to your trainer how you would clean the superglue chambers, humidity chamber, RECOVER, and scanners. What types of maintenance needs to be documented? Where and how would you document maintenance? Pass/Fail.

_____ _____ _____
Trainee Trainer Date

42.5 Written Test – 42.0

_____ _____ _____ _____
Trainee Trainer Date Grade

43.0 Forensic Photography & Digital Preservation of Latent Prints

43.1 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.

43.2 Objectives, Principles, and Knowledge

43.2.1 The trainee shall understand the proper procedures for camera capture and digital scanning of latent and inked print images.

43.2.2 The trainee shall have a 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.

43.2.3 The trainee shall understand the different types of cameras and their suitability for latent print photography.

43.2.4 The trainee shall 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.

43.2.5 The trainee shall have knowledge of and ability to apply special requirements for category 1 vs. category 2 images.

43.2.6 The trainee shall have an 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.)

43.2.7 The trainee shall have the ability to photograph chemically treated and powder developed latent prints of various colors.

43.2.8 The trainee shall the ability to photograph three dimensional impressions (plastic prints).

43.2.9 The trainee shall be able to use and maintain cameras and other equipment.

43.3 Health and Safety Hazards

43.3.1 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.

43.3.2 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.

43.3.3 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.

43.4 Reading and Practical Exercises

43.4.1 Complete 43.0 Reading List.

_____ _____ _____
Trainee Trainer Date

43.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. 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

43.4.3 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.

43.4.3.1 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

43.4.3.2 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 (all full stops)/shutter speeds (at least 5)/ISO combinations (at least 3). Pass/Fail.

_____ _____ _____
Trainee Trainer Date

43.4.3.3 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

43.4.3.4 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

43.4.3.5 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

43.4.4 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

43.4.5 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

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

_____ _____ _____
Trainee Trainer Date

43.5 Written Test – 43.0

_____ _____ _____ _____
Trainee Trainer Date Grade

44.0 General Latent Print Processing

44.1 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 generally 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 shall 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.

44.2 Objectives, Principles, and Knowledge

44.2.1 The trainee shall demonstrate knowledge of the generally accepted techniques for the detection and visualization of friction ridge impressions.

44.2.2 The trainee shall demonstrate knowledge of latent print residue components targeted by different chemical development procedures.

44.2.3 The trainee shall have the ability to assess the effectiveness and results of applied processing techniques.

44.2.4 The trainee shall understand generally accepted preservation methods for friction ridge impressions.

44.2.5 The trainee shall have knowledge of surface and environmental factors affecting selection and sequencing of chemical development procedures.

44.2.6 The trainee shall have knowledge of the effects of various solvents on evidence surfaces (inks, plastics, varnishes, etc.).

44.2.7 The trainee shall demonstrate knowledge of equipment maintenance relative to chemical development of latent prints.

44.3 Health and Safety Hazards

44.3.1 N/A

44.4 Reading and Practical Exercises

44.4.1 Complete 44.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

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

_____	_____	_____
Trainee	Trainer	Date

44.4.3 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

44.4.4 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

44.5 Written Test – 44.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

45.0 Processing Technique – Alternate Light Sources

45.1 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 impression, 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.

45.2 Objectives, Principles, and Knowledge

45.2.1 The trainee shall have knowledge of luminescence, fluorescence, inherent luminescence, light wavelengths, band-pass filters, and light delivery systems as they relate to ALS detection of latent prints.

45.2.2 The trainee shall have knowledge of dye stain procedures used post-cyanoacrylate and the need for ALS processing.

45.2.3 The trainee shall have knowledge of 1, 8-Diazafluoren-9-One (DFO), 1, 2 – Indanedione, and the need for ALS processing.

45.2.4 The trainee shall have knowledge of equipment maintenance relative to ALS detection of latent prints.

45.3 Health and Safety Hazards

45.3.1 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.

45.3.2 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.

45.3.3 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.

45.4 Reading and Practical Exercises

45.4.1 Complete 45.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

45.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. 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

45.4.3 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

45.5 Written Test – 45.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

46.0 Processing Technique – Amido Black

46.1 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.

46.2 Objectives, Principles, and Knowledge

46.2.1 The trainee shall be able to prepare the amido black reagent.

46.2.2 The trainee shall be able to follow ISPFS requirements for quality control checks of prepared reagents.

46.2.3 The trainee shall have basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

46.2.4 The trainee shall demonstrate proper chemical application and preservation of developed prints.

46.2.5 The trainee shall demonstrate proper mixing, use of controls, documentation, storage, and disposal.

46.3 Health and Safety Hazards

46.3.1 Gloves, lab coats, and goggles are worn when mixing or using Amido Black.

46.3.2 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.

46.3.3 5-Sulfosalicylic acid is a corrosive solid capable of causing severe skin burns and eye damage. Avoid breathing in dust and ensure that it does not come into contact with the skin, eyes, or mouth.

46.3.4 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.

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

46.4 Reading and Practical Exercises

46.4.1 Complete 46.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

46.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

46.4.3 Practical Exercise II – Locate and read Safety Data Sheet – Amido Black and carrier solvents.

_____	_____	_____
Trainee	Trainer	Date

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

	_____	_____	_____
MeOH	Trainee	Trainer	Date
	_____	_____	_____
H_2O	Trainee	Trainer	Date

46.4.5 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.

	_____	_____	_____
MeOH	Trainee	Trainer	Date
	_____	_____	_____
H_2O	Trainee	Trainer	Date

46.5 Written Test – 46.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

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

47.1 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.

47.2 Objectives, Principles, and Knowledge

47.2.1 The trainee shall have basic knowledge of the chemicals, the latent print matrices with which they react, potential safety hazards, and appropriate substrates for use.

47.2.2 The trainee shall demonstrate proper chemical application and preservation of developed prints.

47.2.3 The trainee shall demonstrate proper mixing, use of controls, documentation, storage, and disposal.

47.3 Health and Safety Hazards

47.3.1 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 or well-ventilated area.

47.3.2 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.

47.3.3 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.

47.3.4 1,2 Indanedione may be harmful by: inhalation, ingestion and skin absorption. May cause skin and eye irritation.

47.3.5 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.

47.3.6 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.

47.3.7 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.

47.3.8 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.

47.4 Reading and Practical Exercises

47.4.1 Complete 47.0 Reading List.

_____ _____ _____
Trainee Trainer Date

47.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

47.4.3 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

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

_____ _____ _____
Trainee Trainer Date

47.4.5 Practical Exercise IV – Trainer led lesson on the mixing of 1, 2 – Indanedione stock and working solutions.

_____ _____ _____
Trainee Trainer Date

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

_____ _____ _____
Trainee Trainer Date

47.4.7 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

47.4.8 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

47.4.9 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

47.5 Written Test – 47.0

_____ _____ _____ _____
Trainee Trainer Date Grade

48.0 Processing Technique – Dye Stains – Rhodamine 6G and RAM

48.1 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 540nm.

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.

48.2 Objectives, Principles, and Knowledge

48.2.1 The trainee shall have basic knowledge of the chemicals, the latent print matrices with which they react, potential safety hazards, and appropriate substrates for use.

48.2.2 The Trainee shall demonstrate proper chemical application and preservation of developed prints.

48.2.3 The trainee shall demonstrate proper mixing, use of controls, documentation, storage, and disposal.

48.3 Health and Safety Hazards

48.3.1 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.

48.3.2 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.

48.3.3 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.

48.3.4 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.

48.4 Reading and Practical Exercises

48.4.1 Complete 48.0 Reading List.

_____ _____ _____
Trainee Trainer Date

48.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

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

_____ _____ _____
Trainee Trainer Date

48.4.4 Practical Exercise III – Trainer led lesson on the mixing of Rhodamine 6G.

_____ _____ _____
MeOH Trainee Trainer Date

_____ _____ _____
H_2O Trainee Trainer Date

48.4.5 Practical Exercise IV – Trainer led lesson on the mixing of RAM stock and working solutions.

_____ _____ _____
Trainee Trainer Date

48.4.6 Practical Exercise V – 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

48.5 Written Test – 48.0

_____ _____ _____ _____
Trainee Trainer Date Grade

49.0 Processing Technique – Gentian Violet/Crystal Violet

49.1 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.

49.2 Objectives, Principles, and Knowledge

49.2.1 The trainee shall have basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

49.2.2 The trainee shall demonstrate proper chemical application and preservation of developed prints.

49.2.3 The trainee shall demonstrate proper mixing, use of controls, documentation, storage, and disposal.

49.3 Health and Safety Hazards

49.3.1 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.

49.3.2 Gentian Violet should not be used in large amounts.

49.3.3 A dust mask 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 examiner should wear a lab coat, heavy-duty (non-disposable) gloves and safety glasses.

49.4 Reading and Practical Exercises

49.4.1 Complete 49.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

49.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

49.4.3 Practical Exercise II – Locate and read Safety Data Sheet – Gentian Violet.

_____	_____	_____
Trainee	Trainer	Date

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

_____	_____	_____
Trainee	Trainer	Date

49.4.5 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

49.5 Written Test – 49.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

50.0 Processing Technique – Iodine

50.1 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.

50.2 Objectives, Principles, and Knowledge

50.2.1 The trainee shall have basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

50.2.2 The trainee shall demonstrate proper chemical application and preservation of developed prints.

50.2.3 The trainee shall demonstrate proper use of controls, documentation, storage, and disposal.

50.3 Health and Safety Hazards

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

50.3.2 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.

50.3.3 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.

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

50.4 Reading and Practical Exercises

50.4.1 Complete 50.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

50.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

50.4.3 Practical Exercise II – Locate and read Safety Data Sheet – Iodine.

_____	_____	_____
Trainee	Trainer	Date

50.4.4 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

50.5 Written Test – 50.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

51.0 Processing Technique – Leuco Crystal Violet (LCV)

51.1 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.

51.2 Objectives, Principles, and Knowledge

51.2.1 The trainee shall have basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

51.2.2 The trainee shall demonstrate proper chemical application and preservation of developed prints.

51.2.3 The trainee shall demonstrate proper mixing, use of controls, documentation, storage, and disposal.

51.3 Health and Safety Hazards

51.3.1 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.

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

51.3.3 A dust mask 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 examiner should wear a lab coat, gloves and safety glasses.

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

51.4 Reading and Practical Exercises

51.4.1 Complete 51.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

51.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

51.4.3 Practical Exercise II – Locate and read Safety Data Sheet – Leuco Crystal Violet and carrier solvents.

_____	_____	_____
Trainee	Trainer	Date

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

Formula A

_____	_____	_____
Trainee	Trainer	Date

Formula B

_____	_____	_____
Trainee	Trainer	Date

51.4.5 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

51.5 Written Test – 51.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

52.0 Processing Technique – Ninhydrin and ThermaNin

52.1 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.

52.2 Objectives, Principles, and Knowledge

52.2.1 The trainee shall have basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

52.2.2 The trainee shall demonstrate proper chemical application and preservation of developed prints.

52.2.3 The trainee shall demonstrate proper mixing, use of controls, documentation, storage, and disposal.

52.3 Health and Safety Hazards

52.3.1 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.

52.3.2 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.

52.3.3 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.

52.3.4 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.

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

52.3.6 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).

52.3.7 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.

52.4 Reading and Practical Exercises

52.4.1 Complete 52.0 Reading List.

_____ _____ _____
Trainee Trainer Date

52.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

52.4.3 Practical Exercise II – Locate and read Safety Data Sheet – Ninhydrin, ThermaNin, and carrier solvents.

_____ _____ _____
Trainee Trainer Date

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

_____ _____ _____
Trainee Trainer Date

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

_____ _____ _____
Trainee Trainer Date

52.4.6 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

52.4.7 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

52.5 Written Test – 52.0

_____ _____ _____ _____
Trainee Trainer Date Grade

53.0 Processing Technique – Powder Development of Latent Prints

53.1 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.

53.2 Objectives, Principles, and Knowledge

53.2.1 The trainee shall understand the basic types of powders and brushes.

53.2.2 The trainee shall have knowledge of surfaces and environmental factors determining brush type, powder type, and color selection.

53.2.3 The trainee shall understand the proper procedures for using different types of hair, fiberglass, and magnetic brushes.

53.2.4 The trainee shall have knowledge of equipment maintenance and safety procedures relative to powder development of latent prints.

53.2.5 The trainee shall have knowledge of lifting tape, gel lifters, hinge lifters, etc.

53.3 Health and Safety Hazards

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

53.3.2 When fingerprint powders are to be used for an extended period of time, a dust mask should be worn to minimize the inhalation of the powder particles.

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

53.4 Reading and Practical Exercises

53.4.1 Complete 53.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

53.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____ _____ _____
Trainee Trainer Date

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

_____ _____ _____
Trainee Trainer Date

53.4.4 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

53.4.5 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

53.5 Written Test – 53.0

_____ _____ _____ _____
Trainee Trainer Date Grade

54.0 Processing Technique – Physical Developer (PD)

54.1 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.

54.2 Objectives, Principles, and Knowledge

54.2.1 The trainee shall have basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

54.2.2 The trainee shall demonstrate proper chemical application and preservation of developed prints.

54.2.3 The trainee shall demonstrate proper mixing, documentation, storage, and disposal.

54.3 Health and Safety Hazards

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

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

54.3.3 Standard laboratory protocol is followed for chemical handling.

54.4 Reading and Practical Exercises

54.4.1 Complete 54.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

54.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

54.4.3 Practical Exercise II – Locate and read Safety Data Sheet for physical developer and maleic acid.

_____	_____	_____
Trainee	Trainer	Date

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

_____	_____	_____
Trainee	Trainer	Date

54.4.5 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

54.5 Written Test – 54.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

55.0 Processing Technique – RECOVER LFT

55.1 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.

55.2 Objectives, Principles, and Knowledge

55.2.1 The trainee shall have basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

55.2.2 The trainee shall demonstrate proper chemical application and preservation of developed prints.

55.2.3 The trainee shall demonstrate proper documentation, storage, and disposal.

55.3 Health and Safety Hazards

55.3.1 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.

55.3.2 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

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

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

55.4 Reading and Practical Exercises

55.4.1 Complete 55.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

55.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

55.4.3 Practical Exercise II – Locate and read Safety Data Sheet for RECOVER DEVLOP precursor.

_____	_____	_____
Trainee	Trainer	Date

55.4.4 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

55.5 Written Test – 55.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

56.0 Processing Technique – Small Particle Reagent (SPR)

56.1 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.

56.2 Objectives, Principles, and Knowledge

56.2.1 The trainee shall have basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

56.2.2 The trainee shall demonstrate proper chemical application and preservation of developed prints.

56.2.3 The trainee shall demonstrate proper mixing, use of controls, documentation, storage, and disposal.

56.3 Health and Safety Hazards

56.3.1 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.

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

56.3.3 Standard laboratory protocol is followed for chemical handling.

56.4 Reading and Practical Exercises

56.4.1 Complete 56.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

56.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

56.4.3 Practical Exercise II – Locate and read Safety Data Sheet - traditional and white SPR.

_____	_____	_____
Trainee	Trainer	Date

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

_____	_____	_____
Trainee	Trainer	Date

56.4.5 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

56.4.6 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

56.5 Written Test – 56.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

57.0 Processing Technique – Sticky Side Powder/Sticky Side Powder Equivalent

57.1 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.

57.2 Objectives, Principles, and Knowledge

57.2.1 The trainee shall have basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

57.2.2 The trainee shall demonstrate proper chemical application and preservation of developed prints.

57.2.3 The trainee shall demonstrate proper mixing, use of controls, documentation, storage, and disposal.

57.3 Health and Safety Hazards

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

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

57.3.3 Standard laboratory protocol is followed for chemical handling.

57.4 Reading and Practical Exercises

57.4.1 Complete 57.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

57.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. . Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

57.4.3 Practical Exercise II – Locate and read Safety Data Sheet – Sticky Side Powder.

_____	_____	_____
Trainee	Trainer	Date

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

_____	_____	_____
Trainee	Trainer	Date

57.4.5 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

57.5 Written Test – 57.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

58.0 Processing Technique – Sudan Black

58.1 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.

58.2 Objectives, Principles, and Knowledge

58.2.1 The trainee shall have basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

58.2.2 The trainee shall demonstrate proper chemical application and preservation of developed prints.

58.2.3 The trainee shall demonstrate proper mixing, use of controls, documentation, storage, and disposal.

58.3 Health and Safety Hazards

58.3.1 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.

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

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

58.3.4 Standard laboratory protocol is followed for chemical handling.

58.4 Reading and Practical Exercises

58.4.1 Complete 58.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

58.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

58.4.3 Practical Exercise II – Locate and read Safety Data Sheet – Sudan Black and carrier solvents.

_____	_____	_____
Trainee	Trainer	Date

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

_____	_____	_____
Trainee	Trainer	Date

58.4.5 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

58.5 Written Test – 58.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

59.0 Processing Technique – Cyanoacrylate Ester (Super Glue®)

59.1 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 latent impression. 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).

59.2 Objectives, Principles, and Knowledge

59.2.1 The trainee shall have basic knowledge of the chemical, the latent print matrices with which it reacts, potential safety hazards, and appropriate substrates for use.

59.2.2 The trainee shall demonstrate ability to properly utilize the CAE fuming chambers, wands, and vacuum chambers.

59.2.3 The trainee shall demonstrate proper preservation of developed prints.

59.2.4 The trainee shall demonstrate proper use of controls, documentation, storage, and disposal.

59.3 Health and Safety Hazards

59.3.1 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.

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

59.3.3 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.

59.4 Reading and Practical Exercises

59.4.1 Complete 59.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

59.4.2 Practical Exercise I – Continue adding to the game or other activity you developed in 41.0. Incorporate at least three topics from your reading that you feel are particularly notable. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

59.4.3 Practical Exercise II – Locate and read Safety Data Sheet – CAE.

_____	_____	_____
Trainee	Trainer	Date

59.4.4 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

59.4.5 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

59.4.6 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

59.4.7 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

59.5 Written Test – 59.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

60.0 Case Management and Reporting for Processing

60.1 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.

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 examiner, 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, examiner 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 AdamsWeb.

It is important that measures are taken to prevent loss, deleterious change or tampering of evidence. Latent print examiners must have an awareness of other types of examinations (firearms, DNA, Questioned Documents) that may be present in addition to latent prints. Depending on the circumstances, there may be a need for latent print examiners to assist in the preservation of these samples.

60.2 Objectives, Principles, and Knowledge

60.2.1 The trainee shall have knowledge of, and the ability to demonstrate, proper procedures for maintaining chain of custody (documentation and physical control).

60.2.2 The trainee shall have knowledge of, and the ability to demonstrate, proper procedures for handling and marking physical evidence received for examination.

60.2.3 The trainee shall have the ability to navigate and query ILIMS for latent print processing cases.

60.2.4 The trainee shall have the 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.

60.2.5 The trainee shall understand how to prevent contamination.

60.2.6 The trainee shall demonstrate proper procedures for the collection and preservation of potential DNA from firearms, drink containers, and other items as requested by biology.

60.2.7 The trainee shall demonstrate their ability to properly aquire scans of fired cartridge case samples submitted to the laboratory.

60.2.8 The trainee shall have a basic understanding of questioned document examination to include the concepts of indented writing and handwriting comparison and know when it is appropriate to preserve handwriting or refer a case for questioned document examination.

60.2.9 The trainee shall have knowledge of, and the ability to demonstrate, proper procedures for reporting latent print processing examination findings in an accurate, concise, and clear manner.

60.2.10 The trainee shall understand and be able to articulate release of information policies, i.e. with whom, when, and how results may be given to customers.

60.3 Health and Safety Hazards

60.3.1 N/A

60.4 Reading and Practical Exercises

60.4.1 Complete 60.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

60.4.2 Practical Exercise I – ILIMS Latent Print Orientation - shadow three different examiners and observe the completion of 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

60.4.3 Practical Exercise II – Trainer led lesson on what types of evidence is routinely swabbed for DNA preservation by latent print examiners and when this function is carried out by scientists in the Biology section. Topics of discussion/demonstration shall include cleaning/workstation set-up, proper PPE, collection techniques, documentation, sample packaging, sub-item creation in ILIMS.

_____	_____	_____
Trainee	Trainer	Date

60.4.4 Practical Exercise III – Trainee shall demonstrate to trainer cleaning/workstation set-up, proper use of PPE, swab collection, and documentation for one firearm and one drink container. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

60.4.5 Practical Exercise IV – Completion of online training course "Cadre Versa Scanner – Setup and Use of the Cadre Forensics Versa Scanner" (attach screen shot of completion).

_____	_____	_____
Trainee	Trainer	Date

60.4.6 Practical Exercise V – Trainer led lesson on the use of the Cadre Versa Portable Scanner. Topics of discussion/demonstration shall include cleaning/workstation set-up, proper PPE, types and quantities of cartridge case evidence that is routinely scanned, use of associated software, case documentation, and sample naming. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

60.4.7 Practical Exercise VI – Trainee shall successfully acquire a minimum of 15 cartridge case samples according to the analytical method using the Versa Portable Scanner. *Scans will be reviewed by the Firearms Discipline lead.* Pass/Fail.

_____	_____	_____
Trainee	Firearms DL	Date

60.4.8 Practical Exercise VII – "100 Prints – Sufficiency Exercise" Trainee will assess 100 prints for comparison utility. Passing score is 90%.

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

60.4.9 Practical Exercise VIII - 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 examiner in custody of the items. Items shall remain in the custody of the trainer. The trainee will handle, examine and perform testing on each item under direct supervision of the case examiner. A notation will be made in the case notes as to the trainee acting as hands of the analyst. The report will be issued by the qualified examiner/trainer.

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

60.4.10 Practical Exercise IX – Trainee shall independently produce three latent print processing case reports. Pass/Fail.

_____	_____	_____
Trainee	Trainer	Date

60.5 Written Test – 60.0

_____	_____	_____	_____
Trainee	Trainer	Date	Grade

60.6 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

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

_____	_____	_____
Trainee	Trainer	Date

61.0 Multimodal Biometric Identification System (MBIS)

61.1 Background and Theory

Image Acquisition - The training program shall include an introduction to the processes associated with the image capture of friction ridge impressions in ABIS if trainees will perform these job functions.

Function and Uses of MBIS - The training program shall include an introduction to ABIS functionality, ABIS interoperability, and the general use of ABIS if trainees will perform these job functions.

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.

61.2 Objectives, Principles, and Knowledge

61.2.1 The trainee shall be able to describe the types of friction ridge recordings captured by MBIS (e.g., rolled, flat, simultaneous, palm, and supplemental impressions).

61.2.2 The trainee shall be able to describe the methods of friction ridge capture by MBIS (e.g. livescan or card scan).

61.2.3 The trainee shall be able to describe the types of capture devices used by MBIS (e.g., livescan, flatbed scanner, and camera).

61.2.4 The trainee shall be able to explain point of capture variables (e.g., condition of the friction ridge skin, condition of the platen, rolling speed, ink volume, and movement).

61.2.5 The trainee shall be able to explain control measures needed to achieve quality friction ridge images (e.g., scan resolution, compression rate, equipment maintenance, and calibration).

61.2.6 The trainee shall be able to describe procedures for addressing amputations, temporary injuries, skin conditions, and rescans.

61.2.7 The trainee should be able to explain the MBIS processes related to latent print acquisition, classification, search, storage, retrieval, identification, and reporting.

61.2.8 The trainee shall be able to describe composite records and multi-incident systems.

61.2.9 The trainee shall be able to describe the MBIS friction ridge search criteria (e.g., designation of finger or palm search and designation of specific fingers or palm regions)

61.2.10 The trainee should be able to explain the system controls that ensure completeness, image quality, and data integrity.

61.2.11 The trainee shall be able to recall practices detailed in MBIS user guides and the analytical method.

61.2.12 The trainee shall be able to describe MBIS system tolerance for image rotation.

61.2.13 The trainee shall be able to explain factors related to searching and matching minutiae in MBIS (e.g., minutiae extraction, minutiae matching, minutiae placement, minutiae rotation, and ridge counts between minutiae).

61.2.14 The trainee should be able to describe the Extended Feature Set (EFS) image and feature search profiles as detailed in the National Institute of Standards and Technology Special Publication 1151, Markup Instructions for Extended Feature Sets.

61.2.15 The trainee should be able to describe ANSI NIST record types (Type-1, Type-2, Type-4, Type-9, Type-13, Type-14, Type-15) and their importance for ABIS interoperability.

61.2.16 The trainee shall be able to describe how friction ridge images are correlated with personal descriptors in MBIS.

61.2.17 The trainee should be able to explain the significance of the range of candidate scores, threshold scoring, candidate list, and candidate list scores from MBIS.

61.2.18 The trainee should be able to describe the search capabilities of the MBIS (e.g., latent to latent, latent to tenprint, tenprint to latent, tenprint to tenprint, and palm print to palm print).

61.2.19 The trainee should be able to explain the “lights out” process of searching in MBIS.

61.2.20 The trainee shall be able to list the MBIS search progression options and procedures (e.g., local, state, regional, and national).

61.2.21 The trainee shall be able to explain the benefits and risks of using MBIS search parameters to limit database penetration (e.g., finger position, sex, pattern classification and referencing race, offense, and geographical location).

61.2.22 The trainee shall be able to describe search result outcomes in MBIS (e.g., ranked order, unique identifier, and finger or palm position).

61.2.23 The trainee should be able to explain image properties and compression issues associated with MBIS (e.g., potential loss of quality due to compression of images, monitor resolution, and capture resolution).

61.2.24 The trainee shall be able to explain printer technology limitations and the quality degradation of printed images compared to digital images (on screen) and original lift cards.

61.2.25 The trainee shall be able to explain the manual encoding and automatic encoding process in MBIS.

61.2.26 The trainee shall be able to recite the record authentication processes used by ABIS (e.g., correct association of name, unique identifier, and friction ridge images).

61.2.27 The trainee shall demonstrate competency in the utilization of the NEC Multimodal Biometric Identification System (MBIS) and the Integrated Automated Fingerprint Identification System (IAFIS) interface.

61.3 Health and Safety Hazards

61.3.1 N/A

61.4 Reading and Practical Exercises

61.4.1 Complete 61.0 Reading List.

_____ _____ _____
Trainee Trainer Date

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

_____ _____ _____
Trainee Trainer Grade

61.4.3 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

61.4.4 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

61.5 Written Test – 61.0

_____ _____ _____ _____
Trainee Trainer Date Grade

62.0 DNA Database Fingerprint Comparison

62.1 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.

62.2 Objectives, Principles, and Knowledge

62.2.1 The trainee shall understand the basic biology and physiology of friction ridge skin.

62.2.2 The trainee shall understand the basic foundations of the science of friction ridge identification (persistence and discriminability).

62.2.3 The trainee shall be able to define common terminology associated with friction ridge pattern recognition (arch, loop, and whorl).

62.2.4 The trainee shall be able to differentiate between pattern types.

62.2.5 The trainee shall be able to identify 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 an identification.

62.2.6 The trainee shall be able to successfully analyze and compare known fingerprint cards to plain inked fingerprint impressions.

62.2.7 The trainee shall be able to render an accurate conclusion (identification, inconclusive, exclusion).

62.2.8 The trainee shall understand the necessity for verification by another qualified examiner.

62.3 Health and Safety Hazards

62.3.1 N/A

62.4 Reading and Practical Exercises

62.4.1 Complete 62.0 Reading List.

_____ _____ _____
Trainee Trainer Date

62.4.2 Practical Exercise I – Trainer led lesson on comparison.

_____ _____ _____
Trainee Trainer Date

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

_____ _____ _____
Trainee Trainer Date

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

_____ _____ _____ _____
Trainee Trainer Date Grade

62.4.5 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

62.5 Written Test – 62.0

_____ _____ _____ _____
Trainee Trainer Date Grade

62.6 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

63.0 Administrative and Technical Review

63.1 Background and Theory

Administrative and Technical reviews are an integral part the laboratory's quality assurance system and must be completed on 100% of latent print cases to ensure the reports issued to customers meet all of the laboratory's quality standards. It also ensures the conclusions made are scientifically reasonable and based upon documented data and analysis. In general, the review will verify that all documentation is accurate, legible, free of clerical errors and consistent with laboratory protocols. Some specific elements of the review will include, but are not limited to, the following: all testing was accurately documented in the notes packet; the data generated meets all of the required specifications; the casework report accurately reflects the evidence examined, testing performed, the analyst's conclusions, the evidence chain of custody has been completed. The administrative and technical review must be performed by a second qualified analyst and prior to the release of results .

63.2 Objectives, Principles, and Knowledge

63.2.1 The trainee must have been previously approved to perform and have gained experience performing independent casework prior to beginning this section.

63.2.2 The trainee shall be able to define andministrative and technical review.

63.2.3 Trainee shall have knowledge of and the ability to demonstrate proper procedures for administrative review.

63.2.4 Trainee shall have knowledge of and the ability to demonstrate proper procedures for technical review.

63.3 Health and Safety Hazards

63.3.1 N/A

63.4 Reading and Practical Exercises

63.4.1 Complete 63.0 Reading List.

_____	_____	_____
Trainee	Trainer	Date

63.4.2 Practical Exercise I – Technical review training for comparison/MBIS cases - Trainer led discussion and/or demonstration.

_____	_____	_____
Trainee	Trainer	Date

63.4.3 Practical Exercise II – Trainee shall perform administrative and technical review on a *minimum* of ten comparison/MBIS case reports authored by examiners other than 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
Trainee	Trainer	Date	Case

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

Trainee	Trainer	Date

63.4.5 Practical Exercise IV – Trainee shall perform administrative and technical review on a *minimum* of ten processing case reports, authored by examiners other than 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
Trainee	Trainer	Date	Case

Appendix I – Reading Lists

3.0 Reading List: Features on the Surface of Friction Ridge Skin

Friction Ridge Skin - James F. Cowger
Chapter 3, "Classification." Pages 35-70 _____ _____

Registry Proposed - OSAC-2022-S-0038 Standard for Feature Selection in Friction Ridge Examination _____ _____

Fingerprints and Other Ridge Skin Impressions - Champod, et al. Second Edition
Chapter 1- Section 1.5-1.6 _____ _____

Paper – "A Survey of Naming Conventions for the Different Minutia Types in Friction Ridge Examination." H. Eldridge et al. Journal of Forensic Identification 2024. 74(3): 251-281-127 _____ _____

Paper – "Interpapillary Lines – The Variable Part of the Human Fingerprint." Stucker et al. Journal of Forensic Science. 2001. 46(4): 857-861 _____ _____

4.0 Reading List: Categorization and the Use of Features on the Surface of the Friction Ridge Skin

Paper – "Features of the Friction Ridge Skin: Attributes, Diagnosticity, and Limitations." A. White. Journal of Forensic Identification 2022. 72(1): 33-127 _____ _____

ASB Technical Report 012, Technical Report on the Articulation of the Reasoning and Foundational Principles Behind Friction Ridge Examinations, First Edition, 2025 _____ _____

Fingerprints, Palms, and Soles: An Introduction to Dermatoglyphics - Cummins, H. and C. Midlo. 1976, 3rd Edition. Research Publishing Company, South Berlin, MA
Chapter 6, pg. 120-129 _____ _____

5.0 Reading List: General Anatomy of the 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 _____ _____

Fingerprints and Other Ridge Skin Impressions - Champod, et al. Second Edition
Chapter 1- Friction Ridge Skin and Prints; section 1.2 _____ _____

6.0 Reading List: General Physiology of the 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 _____ _____

Fingerprints and Other Ridge Skin Impressions - Champod, et al. Second Edition
Chapter 1- Friction Ridge Skin and Prints _____ _____

7.0 Reading List: Wound Healing in the 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 – Sections 2.4-2.5
_____ _____

Paper – "Scars in Friction- Ridge Skin." Evidence Technology Magazine July-August 2005 26-28
_____ _____

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

8.0 Reading List: Aging of the 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 – Section 2.4
_____ _____

Paper - "Longitudinal and retrospective study has demonstrated morphometric variations in the fingerprints of elderly individuals." L. Silva et al. Forensic Science International. 2016. 259. 41-46 _____ _____

Paper – "Sexual and topological differences in palmprint and ridge density in the Caucasian Spanish population." Gutierrez-Redomero, E. and C. Alonso-Rodriguez. 2013. FSI 229, 159.e1-159.e10
_____ _____

9.0 Reading List: Common Disorders of the Friction Ridge Skin

Paper – "Influence of Skin Diseases on Fingerprint Recognition." Drahansky et al. J Biomed Biotechnol. 2012;2012:626148 _____ _____

Paper – "Chemotherapy and Fingerprint Loss: Beyond Cosmetic." M. Al-Ahwal. The Oncologist. 2012;17(2):291-3 _____ _____

Module 9.0 Supplemental Information Packet _____ _____

10.0 Reading List: Embryological Development of the Hands and Feet

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 3 - Embryology and Morphology of Adult Friction Ridge Skin – Sections 3.1-3.3, & 3.7
_____ _____

Fingerprints and Other Ridge Skin Impressions - Champod, et al., Second Edition
Chapter 1; sections 1.2 _____ _____

11.0 Reading List: Embryological Development of the Friction Ridge Skin

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 3 - Embryology and Morphology of Adult Friction Ridge Skin – Sections 3.4-3.8
_____ _____

Fingerprints and Other Ridge Skin Impressions - Champod, et al., Second Edition
Chapter 1- Sections 1.1-1.9 _____ _____

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

Paper - "Merkel cells and the individuality of friction skin." F Kucken, M. and C. Champod. Journal of Theoretical Biology. 2013. 317. 229-237 _____ _____

12.0 Reading List: Developmental Noise, Developmental Stability, and Fluctuating Asymmetry

The Fingerprint Sourcebook – Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 3 – Embryology and Morphology of Friction Ridge Skin – Sections 3.8-3.10 _____ _____

Paper - "Noise in Gene Expression: Origins, Consequences, and Control." Raser, J. and E. O'Shea. Science. 2005. Vol. 39. 2010 – 2013 _____ _____

Paper - "Genetic and Environmental Influence on the Asymmetry of Dermatoglyphic Traits." Pechenkina, E. et al. American Journal of Physical Anthropology, 2000 _____ _____

13.0 Reading List: History

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 13 Supplemental Information Packet _____ _____

14.0 Reading List: Introduction to Fingerprint Classification Systems

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 5 – Systems of Friction Ridge Classification _____ _____

15.0 Reading List: Professional Organizations

International Association for Identification. Standardization Committee Report, 1973 _____ _____

International Association for Identification. Resolution VII, 1979 _____ _____

International Association for Identification. Standardization II Committee Report, 2010 _____ _____

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

International Association for Identification. Resolution 2010-18, 2010 _____ _____

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 of the National Academy of Sciences, 2009. Executive Summary _____ _____
Friction Ridge Analysis pages 136-145 _____ _____

PCAST Forensic Science in Criminal Courts: Ensuring the Scientific Validity of Feature-Comparison Methods.
Executive Summary _____ _____
Introduction _____ _____

16.0 Reading List: Twin Fingerprints

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
Section 14.3.1.1 and 14.3.1.2 _____ _____

Paper – "On the similarity of identical twin fingerprints." Jain, A., et al. Pattern Recognition. 2002. 35. 2653-2663 _____ _____

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

Paper – "Fingerprint Comparison. I: Similarity of Fingerprints." Lin, C.H., et al. "Fingerprint Comparison I: Similarity of Fingerprints." Journal of Forensic Science. April 1982. 27(2):290-304 _____ _____

Paper – "A Computational Discriminability Analysis on Twin Fingerprints."

Computational Forensics. Liu, Y. and S. Srihari. Proceedings of the Third International Workshop, IWCF 2009, Volume 5718; 43-54 _____ _____

Paper – "Fingerprint Recognition with Identical Twin Fingerprints." Tao, X. et al. PLoS ONE 7(4):e35704. doi:10.1371/journal.pone.0035704 _____ _____

17.0 Reading List: Fingerprint Pattern Distribution and Fingerprint Minutia Distribution

Paper - "Biological variability of the minutiae in the fingerprints of a sample of the Spanish population." Gutierrez, E. Forensic Science International. 2007. 172. 98-105 _____ _____

Paper – "Distribution of minutiae in the fingerprints of a sample of the Spanish population." Gutierrez-Redomero, E., et al. Forensic Science International, 2010. 208. 79-90 _____ _____

Fingerprints and Other Ridge Skin Impressions - Champod, C., et al. 2016. 2nd Edition. Appendix A and B _____ _____

18.0 Reading List: Statistics and Fingerprint Probability Models

Introduction to the Practice of Statistics. Moore, D.S., G.P. McCabe, and B.A. Craig. W. H. 2016. 9th edition
Chapter 1 – Looking at Data - Distributions _____ _____
Chapter 2 – Looking at Data - Relationships _____ _____
Chapters 4 – Probability: The Study of Randomness _____ _____

Understanding Uncertainty. 2nd edition. Lindley, D.V. 2014
Chapter 1- Uncertainty _____ _____
Chapter 6-Bayes Rule _____ _____

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 Section 14.3.1.3 _____ _____

Advances in Fingerprint Technology - Ramatowski, R. ed. 2013. 3rd Edition. CRC Press, New York, Chapter 15 _____ _____

Fingerprints and Other Ridge Skin Impressions - Champod, C., et al. 2016. 2nd Edition
Chapter 2, Sections 2.6-2.8 _____ _____

Paper - "Modern statistical models for forensic fingerprint examinations: A critical review." Abraham, J., et al. Forensic Science International. 2013. 232. 131-150
_____ _____

Paper - "A method for the statistical interpretation of friction ridge skin impressions evidence: Method development and validation." Swofford, H. et al. Forensic Science International. 2018. 287. 113-126 _____ _____

Paper – "Quantifying the weight of evidence from a forensic fingerprint comparison: A new paradigm." Neumann, C. et al. J. R. Statist. Soc. A 175 (2012) Part 2 371-415
_____ _____

Paper - "Operational benefits and challenges of the use of fingerprint statistical models: A field study." Neumann, C. et al. Forensic Science International. 2011. 212. 32-46
_____ _____

Paper - "Quantifying the weight of fingerprint evidence through the spatial relationships, directions, and types of minutia observed on fingermarks." Neumann, C. et al. Forensic Science International. 2015. 248. 154-171 _____ _____

Paper - "Fingerprint Error Rates and Proficiency Test: What they are and Why they Matter." J. Koehler, UC Law Journal. Vol. 59, Issue 5, 2008 _____ _____

Module 18 Supplemental Information Packet _____ _____

19.0 Reading List: Full and Partial Exemplar Fingerprints

Fingerprints and Other Ridge Skin Impressions - Champod, et al. Second Edition
Chapter 2, pg. 33-38. _____ _____

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

The Science of Fingerprints - FBI
Chapter II - Types of Patterns and Their Interpretations. _____ _____
Chapter III - Questionable Patterns _____ _____

20.0 Reading List: Tip and Edge Exemplar Fingerprints

Note: readings for this section were covered in 19.0

21.0 Reading List: Full and Partial Exemplar Proximal and Middle Phalange Prints

Fingerprints, Palms, and Soles: An Introduction to Dermatoglyphics - Cummins, H. and C. Midlo. 1976, 3rd Edition. Research Publishing Company, South Berlin, MA
Chapter 4, pg. 83 _____ _____

Module 21 Supplemental Information Packet _____ _____

22.0 Reading List: Full and Partial Exemplar Palm Prints

"Palm Prints." Encyclopedia of Forensic Science. Maceo, A. et al. 2013, 2nd Edition. Elsevier
_____ _____

Fingerprints, Palms, and Soles: An Introduction to Dermatoglyphics - Cummins, H. and C. Midlo. 1976, 3rd Edition. Research Publishing Company, South Berlin, MA
Chapter 5 pgs. 83-106 _____ _____

Quantitative-Qualitative Friction Ridge Analysis - David R. Ashbaugh
Chapter VIII, pgs.177-192 _____ _____

Palm Print Comparison Techniques course packet - Ron Smith _____ _____

Paper - "Frequency of Patterns in Palms." Ray, E. Journal of Forensic Identification. 2012. 62(6): 568-587 _____ _____

Module 22 Supplemental Information Packet _____ _____

Note: additional readings for this section were covered in 19.0

23.0 Reading List: Full and Partial Exemplar Foot Prints

Fingerprints, Palms, and Soles: An Introduction to Dermatoglyphics - Cummins, H. and C. Midlo. 1976, 3rd Edition. Research Publishing Company, South Berlin, MA
Chapter 6 _____ _____
Chapter 7 _____ _____

"The Friction Ridge Skin of the Feet." Johnson, D. Encyclopedia of Forensic Science. 2013, 2nd Edition. Elsevier _____ _____

Note: additional readings for this section were covered in 4.0

24.0 Reading List: Recording Fingerprints, Palm Prints, and Footprints

ISPFS Latent Print Section Analytical Method – Taking Known Exemplars

_____ _____

The Science of Fingerprints - FBI
Chapter IX - Techniques for Taking Good Fingerprints. Pages 111-115_____ _____
Chapter X - Problems in Taking Inked Fingerprints. Pages 116-128 _____ _____

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

_____ _____

25.0 Reading List: Introduction to Logic and Reasoning

The logic of inference and decision for scientific evidence, in: Philosophical Foundations of Evidence Law, F. Taroni et al. Oxford: Oxford University Press, 2021, 251–266

_____ _____

"Decision theoretic properties of forensic identification: Underlying logic and argumentative implications." A. Biedermann et al. Forensic Science International 2008. Pages 177, 120-132

_____ _____

Module 25 Supplemental Information Packet _____ _____

Note: readings for this section were covered in 18.0

26.0 Reading List: Visual Interpretation of Ridge Details in Latent Prints: Residue

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

The Fingerprint Sourcebook by Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST), et al.
Chapter 7, Sections 7.1-7.2- Latent Print Development _____ _____

Home Office Center for Applied Science and Technology (CAST). Fingermark Visualisation Manual. 2022. Center for Applied Science and Technology. Section 2.5.11-2.5.12 – Interpretation: distribution of constituents _____ _____

Paper – "A review on the advancements in chemical examination of composition of latent fingerprint residues." Egyptian Journal of Forensic Sciences, 12:6, 2022

_____ _____

Paper - "Water content of latent prints – Dispelling the myth." Kent, T. Forensic Science International. 2016. (266): 134-138 _____ _____

Paper - "Deposition of Bloody Friction Ridge Impressions." Langenburg, G. Journal of Forensic Identification. 2008. (58)3: 355 – 389 _____ _____

27.0 Reading List: Visual Interpretation of Ridge Details in Latent Prints: Contact

Home Office Center for Applied Science and Technology (CAST). Fingermark Visualisation Manual. 2022. Center for Applied Science and Technology. Section 2.5.19 – distortion of marks

_____ _____

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

_____ _____

28.0 Reading List: Visual Interpretation of Ridge Details in Latent Prints: Surfaces

Home Office Center for Applied Science and Technology (CAST). Fingermark Visualisation Manual. 2022. Center for Applied Science and Technology. Section 2.5.13-2.5.14 – substrate effects

_____ _____

29.0 Reading List: Visual Interpretation of Ridge Details in Latent Prints: Processing Techniques

Home Office Center for Applied Science and Technology (CAST). Fingermark Visualisation Manual. 2022. Center for Applied Science and Technology. Section 2.5.15-2.5.18 – reverse-colored/developed marks & reverse-direction mirrored marks _____ _____

Paper - "Reactions of latent prints to exposed blood." Forensic Science International. Praska, N. and G. Langenburg. 2013. (224): 51-58 _____ _____

30.0 Reading List: Introduction to Digital Imaging

ISPFS Latent Print Section Analytical Method - Digital Imaging Procedure

_____ _____

FORAY Adams V6 User Manual 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

_____ _____

ASTM Standard Terminology for Digital and Multimedia Evidence Examination E2916-19e1

_____ _____

ASTM Standard Guide for Forensic Digital Image Processing E2825-19

_____ _____

OSAC DRAFT 2024-N-0011 Standard Guide for Forensic Digital Image Management or the 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 _____ _____

31.0: Reading List: Analysis

ANSI/ASB Standard 015 Standard for Examining Friction Ridge Impressions, First Edition, 2024
_____ _____

ANSI/ASB Best Practice Recommendation 165 Best Practice Recommendation for Analysis of Friction Ridge Impressions, First Edition, 2024 _____ _____

ISPFS Latent Print Section Analytical Method
Feature Selection in Friction Ridge Examination _____ _____
Friction Ridge Examination Methodology ACE _____ _____

ANSI/ASB Standard 145, Standard for Consultation during Friction Ridge Examination, First Edition, 2023 _____ _____

ISPFS Latent Print Section Quality Manual
Consultation _____ _____

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 – The Latent Print Examination Process and Terminology _____ _____
Chapter 3 – Interpreting Latent Prints _____ _____

Friction Ridge Skin - James F. Cowger
Chapter 6 - The Basis for Comparison _____ _____

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

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

Fingerprints and Other Ridge Skin Impressions - Champod, et al. Second Edition
Chapter 2, Section 2.1-2.6 _____ _____
Chapter 5, Section 5.5 Forged and Fabricated Fingerprint Evidence _____ _____

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

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

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

32.0 Reading List: Comparison

ANSI/ASB Best Practice Recommendation 166 Best Practice Recommendation for Comparison and Evaluation of Friction Ridge Impressions, First Edition, 2024 _____ _____

ANSI/ASB Best Practice Recommendation 142 Best Practice Recommendation for the Resolution of Conflicts in Friction Ridge Examination, First Edition, 2022 _____ _____

Friction Ridge Skin - James F. Cowger
Chapter 7 - Comparing Prints _____ _____
Chapter 8 - Some Comparisons of Evidence Prints _____ _____

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

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

Note: additional readings for this section were covered in 31.0

33.0 Reading List: Evaluation:

ANSI/ASB Best Practice Recommendation 166 Best Practice Recommendation for Comparison and Evaluation of Friction Ridge Impressions, First Edition, 2024 _____ _____

ANSI/ASB Standard 013, Standard for Friction Ridge Examination Conclusions, First Edition, 2025 _____ _____

Quantitative-Qualitative Friction Ridge Analysis - David R. Ashbaugh
Chapter IV, Pgs.144-148. _____ _____

A Critical Analysis and Study of the ACE-V Process. Langenburg, G. 2012. University of Lausanne PhD Thesis, Appendix B _____ _____

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

Paper - "Fingermark ridge drift." Alcaraz-Fossoul, J. et al., Forensic Science International. 2016. (258):26-31 _____ _____

Paper – "Fingerprint error rates on close non-matches." Journal of Forensic Sciences: 2021; 66(1): 129–134 _____ _____

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

Note: additional readings for this section were covered in 31.0

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

ANSI/ASB Standard 167 Standard for Reporting Written Results from Friction Ridge Examinations, First Edition, 2024 _____ _____

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

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

A2LA R221 – Specific Requirements – Forensic Accreditation Program: Testing and Calibration _____ _____

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 _____ _____

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

Scientific Working Group on Digital Evidence DRAFT Legal and Scientific Support Related to the Admissibility of Image Examinations or the successor document _____ _____

National Academy of Sciences. Strengthening Forensic Science in the United States: A Path Forward. 1999. National Research Council.
Chapter 3 _____ _____

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 _____ _____

Executive Office of the President, President's Council of Advisor's on Science and Technology (PCAST), Panel on Forensic Science. Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature Comparison Methods. 2016
Executive Summary
Section 8 _____ _____
Section 9 _____ _____

American Association for the Advancement of Science. Forensic Science Assessments: A Quality and Gap Analysis – Latent Fingerprint Examination. Washington, D.C. 2017, pgs. 1-73 _____ _____

Fingerprint Identification: Advances since the 2009 National Research Council Report. Champod, C. Philosophical Transactions B of the Royal Society. 370: 20140259 _____ _____

Department of Justice Uniform Language for Testimony and Reports for the Forensic Latent Print Discipline 08/20. https://www.justice.gov/olp/uniform-language-testimony-and-reports

_____ _____

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

Courtroom Testimony for Fingerprint Examiners – Hillary Moses Daluz

_____ _____

Crime Scene Photography, 2nd Edition – Robinson
Chapter 12 – Legal Issues Related to Photographs and Digital Images _____ _____

Paper - "A guide to interpreting forensic testimony: Scientific approaches to fingerprint evidence." Edmond, G. et al. Law, Probability & Risk. 2014. 13(1): 1-25

_____ _____

Paper - "How to cross-examine forensic scientists: A guide for lawyers." Edmond, G. et al. Australian Bar Review. 2014. (39):174-197 _____ _____

Paper - "The defense challenge to fingerprints." Steele, L. Criminal Law Bulletin. 2004. 40(3): 213-240 _____ _____

Paper - "Fingermark age determinations: Legal considerations, review of the literature and practical propositions." Girod, A., et al. Forensic Science International. (262): 212-226 _____ _____

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 _____ _____

36.0 Reading List: Introduction to Error Rate Calculations and Confidence Intervals

Executive Office of the President, President's Council of Advisor's on Science and Technology (PCAST), Panel on Forensic Science. Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature Comparison Methods. 2016.
Executive Summary
Section 3 _____ _____
Section 4 _____ _____
Section 5.5 _____ _____
Appendix A _____ _____

2016 Addendum to the PCAST report of Forensic Science in Criminal Courts – FP portions _____ _____

Paper – "Accuracy and Reliability of Forensic Latent Fingerprint Decisions." Ulery B. et al. Proceedings of the National Academy of Sciences. 2011. 108(19) _____ _____

Paper – "Miami Dade Research Study for the Reliability of the ACE-V Process: Accuracy & Precision in Latent Fingerprint Examinations." Pacheco, I. et al. NIJ, 2014 _____ _____

Paper – "Testing the Accuracy and reliability of palmar friction ridge comparison – A black box study." Eldridge et al. Forensic Science International 318, 2021 _____ _____

Paper – "Inconclusive decisions and error rates in forensic science." H. Swofford et al. Forensic Science International: Synergy 8, 2024 _____ _____

Paper - "Expert Fingerprint Testimony Post-PCAST – A Canadian Case Study." Wilkinson, D. et al. Journal of Forensic Identification. 2018. 86(3) _____ _____

37.0 0 Reading List: Expert Versus Novice Studies

A Critical Analysis and Study of the ACE-V Process. Langenburg, G. 2012. University of Lausanne PhD Thesis, Sections 9.1.1, 9.1.2, & 9.1.4 _____ _____

Paper – "Behavioral and electrophysical evidence for configural processing in fingerprint experts." Busey, T. and J. Vanderkolk. Vision Research, 2005 _____ _____

Paper - "The nature of expertise in fingerprint examiners." Busey, T. and F. Parada. Psychonomic Bulletin & Review. 2010 17(2): 155-160 _____ _____

Paper - "Consistency and variability among latent print examiners as revealed by eye tracking methodologies." Busey, T., et al. Journal of Forensic Identification. 2011

_____ _____

Paper – "Identifying fingerprint expertise." Tangen, J. et al. Association for Psychological Science. Vol 22, No. 8, 2011 _____ _____

Paper – "An expert-novice comparison of feature choice." Robson et al. Applied Cognitive Psychology, 34(5) 984-995 _____ _____

38.0 0 Reading List: Expert Studies

A Critical Analysis and Study of the ACE-V Process. Langenburg, G. 2012. University of Lausanne PhD Thesis, Sections 9.1.3 & 9.1.5 _____ _____

Improving the Rigor of the Latent Print Examination Process. Hicklin, A. University of Lausanne PhD Thesis, 2017
Chapter 6 _____ _____

Paper – "The Nature of Expertise in Fingerprint Matching: Experts Can Do a Lot with a Little." Thompson and Tangen. PLoS ONE 9 (12) 2014 _____ _____

Paper - "Consistency and variability among latent print examiners as revealed by eye tracking methodologies." Busey, T., et al. Journal of Forensic Identification. 2011

_____ _____

Paper - "Interexaminer 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.

_____ _____

Paper – "Improving the Understanding and the Reliability of the Concept of Sufficiency in Friction Ridge Examination." Neumann, C. et al. NIJ, 2013 _____ _____

Paper - "Factors associated with latent fingerprint exclusion determinations." Ulery, B. et al. Forensic Science International. 2017 (275): 65-75 _____ _____

39.0 0 Reading List: Human Factors

OSAC DRAFT 2023-S-0026 Technical Report for Task-Relevant Information in Friction Ridge Examination or the successor document _____ _____

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
Chapter 2 – Human Factors and Errors _____ _____
Chapter 7 – A Systems Approach to the Work Environment _____ _____
Chapter 8 – Training and Education _____ _____

Scottish Government. The Fingerprint Inquiry Report, APS Group Scotland, 2011
_____ _____

U.S. Department of Justice Office of Inspector General. A Review of the FBI's Handling of the Brandon Mayfield Case. Office of Inspector General. Oversight and Review Division, 2006
_____ _____

Paper - "The impact of fatigue on latent print examinations as revealed by behavioral and eye gaze testing." Busey, T., et al. Forensic Science International. 2015 _____ _____

Paper - "The forensic confirmation bias: A comparison between experts and novices". Clarie, A. J., et al. Journal of Forensic Sciences. 2019 _____ _____

Paper - "Cognitive bias research in forensic science: A systematic review". Cooper, G., Meterko, V. Forensic Science International. 2019 _____ _____

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

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
_____ _____

40.0 Reading List: Quality Assurance

ANSI/ASB Best Practice Recommendation 144 Best Practice Recommendation for the Verification Component in of Friction Ridge Impression, First Edition, 2022 _____ _____
Addendum 1, 2024 _____ _____

ISPFS Latent Print Analytical Method - Verification _____ _____

ANSI/ASB Best Practice Recommendation 144 Best Practice Recommendation for the Verification Component in Friction Ridge Examination, First Edition, 2022, Addendum 1, 2024
_____ _____

ANSI/ASB Best Practice Recommendation 142 Best Practice Recommendation for the Resolution of Conflicts in Friction Ridge Examination, First Edition, 2022 _____ _____

ISPFS Latent Print Section Quality Manual - Conflict Resolution _____ _____

ANSI/ASB Standard 143 Standard for Technical Review in Friction Ridge Examination, First Edition, 2024 _____ _____

ANSI/ASB Standard 168 Standard for Testimony Monitoring in Friction Ridge Examination, First Edition, 2024 _____ _____

Latent Print Section Quality Manual section - Testimony and Testimony Monitoring
_____ _____

ISPFS Quality/Procedure Manual
Section 14.1.3.1 on "Undue Influence" _____ _____
Section 7.8 on "Reporting of results" _____ _____
Section 17.7.1.3 on "Monitoring Testimony" _____ _____
Section on 8.8 "Internal Audits" _____ _____
Section on 8.7 "Corrective Actions" _____ _____

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

Fingerprints and Other Ridge Skin Impressions - Champod, et al., Second Edition
Chapter 5, Section 5.6.2 Quality Assurance. _____ _____

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 9 – Human Factors Issues for Management _____ _____

Paper - "Evaluating the extent and scope of "verification" in analysis, comparison, and verification (ACE-V)." Black, J. Wiley Encyclopedia of Forensic Science. 2009. John Wiley & Sons, Chichester _____ _____

41.0 Reading List: Laboratory Safety and Reagent Preparation

Latent Print Section Quality Manual sections:
Safety _____ _____
Chemicals, Supplies, and Reagent Preparation _____ _____

Home Office Center for Applied Science and Technology (CAST). Fingermark Visualisation Manual. 2022. Center for Applied Science and Technology
Section 3.2 – Working Safely _____ _____

42.0 Reading List: Equipment Maintenance and Performance Checks

ISPFS Latent Print Section Quality Manual
Equipment, Calibration, and Maintenance _____ _____

Note: additional readings for this section are covered in individual processing methods

43.0 Reading List: Forensic Photography and Digital Preservation of Latent Prints

User manual for the Nikon Z8 _____ _____

User manual for the Nikon D810 _____ _____

User manual for the Canon EOS 6D _____ _____

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

ISPFS Latent Print Section Analytical Method Section - Digital Imaging Procedure _____ _____

Foray Adams v6 User Manual and AdamsWeb Help files _____ _____

ASTM E3235-21 Standard Practice for Latent Print Evidence Imaging Resolution _____ _____

ASTM DRAFT Standard Practice for Training in the Areas of Video Analysis, Image Analysis, and Photography or the successor document _____ _____

OSAC DRAFT 2024-N-0011 Standard Guide for Forensic Digital Image Management or the successor document _____ _____

Scientific Working Group on Digital Evidence DRAFT Guidelines for the Use of Macro Photography in Forensic Science or the 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). Fingermark Visualisation Manual. 2022. 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 _____ _____

44.0 Reading List: General Latent Print Processing

ASB DRAFT Standard for Standard for Processing Evidence for the Detection of Friction Ridge Impressions or successor document _____ _____

ISPFS Latent Print Section Analytical Method - 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). Fingermark Visualisation Manual. 2022. 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, Sections 7.3-7.17- 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 _____ _____

45.0 Reading List: Processing Technique – Alternate Light Sources

ISPFS Latent Print Section Analytical Method - 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). Fingermark Visualisation Manual. 2022. Center for Applied Science and Technology
Section 5.FE – Fluorescence Examination _____ _____

Note: additional readings for this section were covered in 44.0

46.0 Reading List: Processing Technique – Amido Black

ISPFS Latent Print Section Analytical Method - 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). Fingermark Visualisation Manual. 2022. 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 44.0

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

ISPFS Latent Print Section Analytical Method
DFO _____ _____
1, 2 – Indanedione _____ _____
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). Fingermark Visualisation Manual. 2022. Center for Applied Science and Technology.
Section DFO 6.1.13-6.1.25 – DFO _____ _____
Section 5.IND - 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

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

ISPFS Latent Print Section Analytical Method
Rhodamine 6G _____ _____
RAM _____ _____

Home Office Center for Applied Science and Technology (CAST). Fingermark Visualisation Manual. 2022. 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 44.0

49.0 Reading List: Processing Technique – Gentian Violet/Crystal Violet

ISPFS Latent Print Section Analytical Method - Gentian Violet _____ _____

Home Office Center for Applied Science and Technology (CAST). Fingermark Visualisation Manual. 2022. Center for Applied Science and Technology
Section 5.LDBV3 – 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 44.0

50.0 Reading List: Processing Technique – Iodine

ISPFS Latent Print Section Analytical Method - Iodine _____ _____

Home Office Center for Applied Science and Technology (CAST). Fingermark Visualisation Manual. 2022. Center for Applied Science and Technology
Section 6.1.35-6.1.42 – 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 44.0

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

ISPSFS Latent Print Section Analytical Method - Leuco Crystal Violet _____ _____

Home Office Center for Applied Science and Technology (CAST). Fingermark Visualisation Manual. 2022. Center for Applied Science and Technology
Section 6.1.44 – 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 44.0

52.0 Reading List: Processing Technique – Ninhydrin and ThermaNin

ISPFS Latent Print Section Analytical Method
Ninhydrin _____ _____
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). Fingermark Visualisation Manual. 2022. 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 44.0

53.0 Reading List: Processing Technique – Powder Development of Latent Prints

ISPFS Latent Print Section Analytical Method
Powder Detection Methods _____ _____
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). Fingermark Visualisation Manual. 2022. Center for Applied Science and Technology.
Section 5.Lif – Lifting _____ _____
Section 5.Pow – Powders _____ _____
Section 6.2.9 – 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 53 Supplemental Information Packet _____ _____

Note: additional readings for this section were covered in 44.0

54.0 Reading List: Processing Technique – Physical Developer (PD)

ISPFS Latent Print Section Analytical Method - 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). Fingermark Visualisation Manual. 2022. 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 44.0

55.0 Reading List: Processing Technique – RECOVER LFT

ISPFS Latent Print Section Analytical Method – 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
_____ _____

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

ISPFS Latent Print Section Analytical Method - SPR _____ _____

Home Office Center for Applied Science and Technology (CAST). Fingermark Visualisation Manual. 2022. 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." Pat A. Wertheim _____ _____

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

Note: additional readings for this section were covered in 44.0

57.0 Reading List: Processing Technique – Sticky Side Powder/Sticky Side Powder Equivalent

ISPFS Latent Print Section Analytical Method - Sticky Side Powder _____ _____

Home Office Center for Applied Science and Technology (CAST). Fingermark Visualisation Manual. 2022. 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 44.0

58.0 Reading List: Processing Technique – Sudan Black

ISPFS Latent Print Section Analytical Method - Sudan Black _____ _____

Home Office Center for Applied Science and Technology (CAST). Fingermark Visualisation Manual. 2022. Center for Applied Science and Technology
Section 5.LDO – 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 44.0

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

ISPFS Latent Print Section Analytical Method - 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). Fingermark Visualisation Manual. 2022. 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 44.0

60.0 Reading List: Case Management and Reporting for Processing

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

ANSI/ASB Standard 167 Standard for Reporting Results from Friction Ridge Examinations. First Edition, 2024 _____ _____

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

Latent Print Section Quality Manual
Evidence Control and Handling _____ _____
Documentation and Report Writing _____ _____

ISPFS Latent Print Section Analytical Method - Swabbing for DNA Preservation
_____ _____
User manual for the Cadre Versa Scanner _____ _____

ISPFS Latent Print Section Analytical Method – Cadre Versa Scanner
_____ _____

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

Forensic Science Handbook Volume 1, 2nd Edition, - Richard Saferstein.
"Handwriting and Handprinting Identifications." Pages 710-717 _____ _____

Paper – "Integrating DNA Collection into the Latent Print Section." _____ _____

Paper – "Evaluation of the impact of Different Visualization Techniques on DNA in Fingerprints."
_____ _____

ISPFS BEAST ILIMS General User Guide _____ _____

61.0 Reading List: Multimodal Biometric Identification System (MBIS)

ISPFS Latent Print Section Analytical Method – 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 _____ _____

Paper – "The Impact of Human–Technology Cooperation and Distributed Cognition in Forensic Science: Biasing Effects of AFIS Contextual Information on Human Experts." Journal of Forensic Sciences: 2012; 57: 343-352 _____ _____

Paper - "The use of technology in human expert domains: challenges and risks arising from the use of automated fingerprint identification systems in forensic science." Law, Probability, and Risk. 2010. 9, 47-67 _____ _____

Paper - "The relation between sensitivity, similar non-matches and database size in fingerprint database searches." Law, Probability, and Risk. 2014. 13, 151-168
_____ _____

Paper – "Research on the local regional similarity of automatic fingerprint identification system fingerprints based on close non-matches in a ten million people database – Taking the central region of whorl as an example." Journal of Forensic Sciences: 2023. 68, 488-499
_____ _____

62.0 Reading List: DNA Database Comparison Training

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

OSAC DRAFT 2022-S-0038 Standard for Feature Selection in Friction Ridge Examination or the successor document _____ _____

ANSI/ASB Standard 015, First Edition 2024 Standard for Examining Friction Ridge Impressions _____ _____

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." _____ _____

ISPFS Latent Print Section Analytical Method - Friction Ridge Examination Methodology _____ _____

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