

FINGERPRINT EXAMINATION
STANDARDS FOR FORENSIC
PRACTITIONERS IN SOUTH
AFRICA



ACFE™

Association of Certified Fraud Examiners

South Africa Chapter #91

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SECTION A

1. INTRODUCTION: THE FORENSIC STANDARD FORUM

The aim of the Forensic Standard Forum under the auspices of the ACFE SA is to standardise methodologies employed in the course of forensic investigations, which are carried out in conjunction with criminal or civil legislation. Such investigations include almost all disciplines and practices involved.

It is instrumental to lead the way in terms of setting standards in all the disciplines of forensics applied during any given investigation and although there are well known and international standards in most of the disciplines, some changes may be required in order to address the situation in South Africa and Africa in the context of our own environments and applicable legislation and/or legal systems and frameworks.

Forensic scientists and criminal investigators need to be guided with acceptable standards and procedures for carrying out such examinations. Although the ACFE refers to “certified fraud examiners” it recognises the fact that a strong association exists with forensic examiners and practitioners. All forensic disciplines will accordingly be included in the Forensic Standard Forum.

2. THE ACFE

2.1 Background on The ACFE SA Chapter

The need to raise the standard of fraud examination in South Africa and for a professional body which was not limited to a specific profession such as accounting, or law resulted in the establishment of a local chapter with the mission to provide a community environment in which local forensic examination practitioners can associate. Local membership provides a number of benefits including a network of experienced professionals; a training framework for practitioners with "how to" guidance technical updates and ethical standards; regular discussion forums on issues relevant to the local environment; annual workshops on fraud examinations; and a video library with case studies. This chapter is a collection of individuals in South Africa from all industries and professionals, who all have a single goal mind, the reduction of white-collar crime in South Africa.

(*ACFE Professional Standards* – www.acfesa.co.za)

2.2 The preamble of the ACFE SA

The Association of Certified Fraud Examiners is an association of professionals committed to performing at the highest level of ethical conduct. Members of the Association pledge themselves to act with integrity and to perform their work in a professional manner.

Members have a professional responsibility to their clients, to the public interest and each other; a responsibility that requires subordinating self-interest to the interests of those served.

These standards express basic principles of ethical behaviour to guide members in the fulfilling of their duties and obligations. By following these standards, all Certified Fraud Examiners shall be expected, and all Associate members shall strive to demonstrate their commitment to excellence in service and professional conduct.

2.3 Applicability of Code

The CFE Code of Professional Standards shall apply to all members and all Associate members of the Association of Certified Fraud Examiners. The use of the word “member” or “members” in this Code shall refer to Associate members as well as regular members of the Association of Certified Fraud Examiners.

2.4 Standards of Professional Conduct

a. Integrity and Objectivity

- Members shall conduct themselves with integrity, knowing that public trust is founded on integrity. Members shall not sacrifice integrity to serve the client, their employer, or the public interest.
- Prior to accepting the fraud examination, members shall investigate for potential conflicts of interest. Members shall disclose any potential conflicts of interest to prospective clients who retain them or their employer.
- Members shall maintain objectivity in discharging their professional responsibilities within the scope of the engagement.
- Members shall not commit discreditable acts and shall always conduct themselves in the

best interests of the reputation of the profession.

- Members shall not knowingly make a false statement when testifying in a court of law or other dispute resolution forum. Members shall comply with lawful orders of the courts or other dispute resolution bodies. Members shall not commit criminal acts or knowingly induce others to do so.

b. Professional Competence

- Members shall be competent and shall not accept assignments where this competence is lacking. In some circumstances, it may be possible to meet the requirement for professional competence by use of consultation or referral.
- Members shall maintain the minimum program of continuing professional education required by the Association of Certified Fraud Examiners. A commitment to professionalism combining education and experience shall continue throughout the member's professional career. Members shall continually strive to increase the competence and effectiveness of their professional services.

c. Due Professional Care

- Members shall exercise due professional care in the performance of their services. Due professional care requires diligence, critical analysis, and professional scepticism in discharging professional responsibilities.
- Conclusions shall be supported with evidence that is relevant, competent, and sufficient.
- Members' professional services shall be adequately planned. Planning controls the performance of a fraud examination from inception through completion and involves developing strategies and objectives for performing the services.
- Work performed by assistants on a fraud examination shall be adequately supervised. The extent of supervision required varies depending on the complexities of the work and the qualifications of the assistants.

d. Understanding with Client or Employer

- At the beginning of a fraud examination, members shall reach an understanding with those retaining them (client or employer) about the scope and limitations of the fraud examination

and the responsibilities of all parties involved.

- Whenever the scope or limitations of a fraud examination or the responsibilities of the parties change significantly, a new understanding shall be reached with the client or employer.

e. Communication with Client or Employer

- Members shall communicate to those who retained them (client or employer) significant findings made during the normal course of the fraud examination.

f. Confidentiality

- Members shall not disclose confidential or privileged information obtained during the course of the fraud examination without the express permission of proper authority or order of a court. This requirement does not preclude professional practice or investigative body reviews as long as the reviewing organization agrees to abide by the confidentiality restrictions.

2.5 Standards of Examination

a. Fraud Examinations

- Fraud examinations shall be conducted in a legal, professional, and thorough manner. The fraud examiner's objective shall be to obtain evidence and information that is complete, reliable, and relevant.
- Members shall establish predication and scope priorities at the outset of a fraud examination and continuously re-evaluate them as the examination proceeds. Members shall strive for efficiency in their examination.
- Members shall be alert to the possibility of conjecture, unsubstantiated opinion and bias of witnesses and others. Members shall consider both exculpatory and inculpatory evidence.

b. Evidence

- Members shall endeavour to establish effective control and management procedures for documents. Members shall be cognizant of the chain of custody including origin, possession and disposition of relevant evidence and material. Members shall strive to

preserve the integrity of relevant evidence and material.

- Members' work product may vary with the circumstances of each fraud examination. The extent of documentation shall be subject to the needs and objectives of the client or employer.

2.6 Standards of Reporting

a. General

- Members' reports may be oral or written, including fact witness and/or expert witness testimony, and may take many different forms. There is no single structure or format that is prescribed for a member's report; however, the report should not be misleading.

b. Report Content

- Members' reports shall contain only information based on data that are sufficient and relevant to support the facts, conclusions, opinions and/or recommendations related to the fraud examination. The report shall be confined to subject matter, principles, and methodologies within the member's area of knowledge, skill, experience, training, or education.
- No opinion shall be expressed regarding the legal guilt or innocence of any person or party.

3. ACFE CODE OF ETHICS

All Certified Fraud Examiners must meet the rigorous criteria for admission to the Association of Certified Fraud Examiners. Thereafter, they must exemplify the highest moral and ethical standards and must agree to abide by the bylaws of the ACFE and the Certified Fraud Examiner Code of Professional Ethics.

- An ACFE Member shall, at all times, demonstrate a commitment to professionalism and diligence in the performance of his or her duties.
- An ACFE Member shall not engage in any illegal or unethical conduct or any activity which would constitute a conflict of interest.
- An ACFE Member shall, always, exhibit the highest level of integrity in the performance of all professional assignments and will accept only assignments for which there is a

reasonable expectation that the assignment will be completed with professional competence.

- An ACFE Member will comply with lawful orders of the courts and will testify to matters truthfully and without bias or prejudice.
- An ACFE Member, in conducting examinations, will obtain evidence or other documentation to establish a reasonable basis for any opinion rendered. No opinion shall be expressed regarding the guilt or innocence of any person or party.
- An ACFE Member shall not reveal any confidential information obtained during a professional engagement without proper authorization.
- An ACFE Member will reveal all material matters discovered during an examination which, if omitted, could cause a distortion of the facts.
- An ACFE Member shall continually strive to increase the competence and effectiveness of professional services performed under his or her direction.

SECTION B

Background for the Fingerprint Examination Standard

1. Overview of the South African Legal Framework

The purpose of forensic fingerprint examination is to contribute to the judicial processes and ensure a principle of equal justice for all. Fingerprints may however only be used for purposes related to the detection of crime, the investigation of an offence, the identification of missing persons, the identification of unidentified human remains, the conducting of a prosecution, or with the explicit informed consent of the person. These restrictions do not prohibit the use of any fingerprints for the purposes of establishing if a person has been previously convicted of a previous offence.

The ultimate goal of forensic fingerprint examination is to establish reliable evidence with respect to the identity of the subject being investigated. If the evidence is questioned, it should withstand scrutiny – most often scrutiny in judicial processes. If the evidence fails the scrutiny of judicial processes, all of the efforts up to that point are wasted.

Fingerprint evidence can be processed, whether in computerised or other form, in terms of the following legislation:

- The Criminal Procedure Act, Act 6 of 2010;
- South Africa Police Services Act, Act 68 of 1995
- The Firearms Control Act, Act 60 of 2000;
- The Explosives Act, Act 15 of 2003;
- South African Citizenship Act, Act 88 of 1995
- The Protection of Personal Information Act, Act 4 of 2013

According to the Criminal Procedure Act, Act 6 of 2010, a complete set of fingerprints are to be taken of any person who is arrested upon any charge related to an offence, or if there are sufficient grounds to believe that those prints or the results of an examination thereof through a comparative search, will be of value in the investigation by excluding or including those prints. The fingerprints taken must be stored on the fingerprint database maintained by the National Commissioner, as provided for in Chapter 5A of the South African Police Service Act.

In a case where a decision was made not to prosecute a person, or if the person is found not guilty at his or her trial, or if his or her conviction is set aside by a superior court or if he or she is discharged at a preparatory examination or if no criminal proceedings with reference to such fingerprints or body-prints were instituted against the person concerned in any court or if the prosecution declines to prosecute, must be destroyed within 30 days after the officer commanding the Division responsible for criminal records referred to in Chapter 5A of the South African Police Service Act has been notified.

In criminal proceedings in which the collection, receipt, storing, marking, delivery or distribution of any fingerprints or fingerprint data, a document purporting to be an affidavit made by the person who processed the fingerprint information as part of his or her official duties, as the case may be, shall upon the mere production thereof, be prima facie proof of the matter so alleged, provided that the person who made such an affidavit may issue a certificate in lieu thereof, in which event the

provisions of this procedure shall *mutatis mutandis* apply with reference to such certificate.

Any person who, tampers with or manipulates the process or the fingerprints, or falsely claims such fingerprints have been taken from a specific person whilst knowing them to have been taken from another person or source, is guilty of an offence and liable on conviction to imprisonment for a period not exceeding 15 years.

Fingerprint evidence shall not be inadmissible as evidence if it was not taken in accordance with the provisions of sections 36A, 36B, 36C, 36D, 36E or 37 of the Criminal Procedure Act, Act 6 of 2010, or if it was taken or ascertained against the wish or the will of the accused concerned

In the event that fingerprints are collected and processed digitally, it would be regarded as digital evidence. The statutory requirements of digital evidence in South African courts are set out in the Electronic Communication and Transaction Act (25 of 2002).

Some of the most relevant statutory requirements for the authenticity and admissibility of digital evidence are set out in Section 14 and 15 of the Electronic Communication and Transaction Act (25 of 2002). The importance of these two sections in relation to the digital evidence relates to the fact that during the capturing process, the originality, integrity and reliability of evidence should be maintained. In other words, the actions of police officials on a scene and their subsequent interactions with digital evidence can have a direct impact on the acceptance of evidence in court procedures..

Section 14 and 15 of the Electronic Communication and Transaction Act (25 of 2002) provide requirements for the measurement of digital evidence – normal aspects of the rules of evidence or the subsequent evaluation thereof are not excluded. The integrity of digital evidence is assessed by considering whether the evidence has remained complete and unaltered except for the addition of endorsements or any changes, which can be caused in the normal course of communication, storage or display. Fingerprints that are captured with equipment that does not meet i.e. the required image quality standards could therefore be regarded as altered.

It can therefore be concluded that South African courts test the integrity of digital evidence by assessing whether the evidence was changed by the actions of analyses and reliability is tested by assessing the methods used in collecting and processing of the evidence.

2. Overview of International Standards

A. Manual Processing of Fingerprints

The basic method of recording fingerprints can be accomplished by applying a thin coat of black ink directly to the skin's surface. This is typically achieved using a roller and coating an inking plate with the ink and then rolling the fingers onto the plate. Next, the inked skin is pressed on a surface of the fingerprint card. The difference in elevation between the ridges and the furrows of the friction ridge skin leaves a print that is a recording of the unique detail of the friction ridge skin.

Before any ink is applied to the fingers, the fingers must be inspected to ensure that they are clean and dry as well as free from contaminants that can interfere with proper recording. In most cases fingerprint examiners prefer to roll the entire finger with one continuous motion from extreme side to extreme side, including the lower phalanges, to ensure continuity of the impression.

Latent prints on the other hand are recorded by fingerprint lifters. This is achieved by applying of finger-print powders which clings to latent print deposits or contaminants already on a surface. A lift is usually made with tape or a similar lifting material having the correct amount of adhesive to remove enough of the fingerprint powder without destroying the original item.

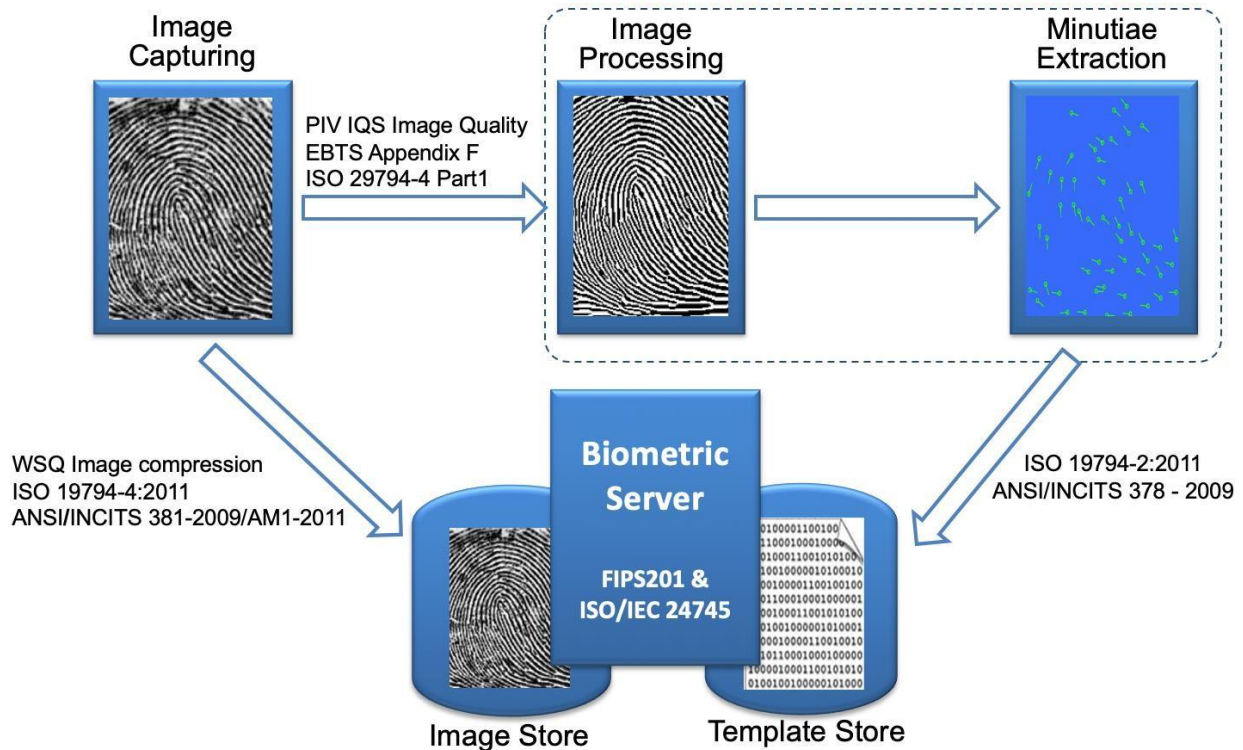
Once the fingerprint data is recorded, it is the fingerprint examiner's responsibility to compare the known print with unknown prints for individualisation purposes. No matter how competent the fingerprint examiner is at performing his job, the gathering of this physical evidence will be futile unless such evidence can be properly processed and analysed.

B. Digital Processing of Fingerprint

Due to the sheer volume of fingerprint processing required today, automating the analyses of such prints has become a critical requirement in assuring greater success in identifying criminal

offenders through the use of fingerprint evidence.

The diagram below relates to the digital capturing and processing of fingerprints and the associated international standards applicable to the various stages in the process.



ISO/IEC 24787 for On-card biometric comparison

A summary of the different stages as depicted in the Figure above include:

- Detection phase – capturing the fingerprint image.
- Image processing phase – filtering the fingerprint image to extract a clear greyscale image free from noise or artefacts.
- Minutiae extraction phase – extracting the matching template.
- Evidence communication phase – fingerprint data is transported from capturing equipment to fingerprint processing equipment.
- Evidence storage phase – fingerprint evidence (image and/or template) is securely stored.
- Evidence analysis phase – evidence is classified/matched to determine relevance.

- Evidence interpretation phase – evidence is examined and interpreted in relation to the case.
- Reporting phase – evidence is reported on.
- Presentation phase – testimonies or overviews are provided regarding evidence.
- Closure phase – cases are archived.

The following International Standards are applicable to the various stages in the digital processing of fingerprints, whether for investigation purposes or plain business use.

Fingerprint Image Capturing	PIV IQS Image Quality EBTS Appendix F ISO 29794-4 Part1
Image Filtering	ISO 19794-2:2011 ANSI/INCITS 378-2009
Image Comparison	WSQ grey-scale compression ISO 19794-4:2011 ANSI 381-2009/AM1-2011
Fingerprint Image storing	FIPS201 ISO/IEC 24745
Card-based Fingerprint Matching	ISO/IEC 24787

3. Fingerprint Examinations as a Science

A fingerprint examiner is a person that uses various chemicals and reagents on a crime scene/exhibit in search of latent fingerprints. The examiner also has the ability to lift, photograph and classify developed fingerprints that can be searched on the National Database for individualization or identification purposes.

The following definitions apply:

The forensic science discipline	Forensic examination of documents, movable items with potential evidential value and incident scenes for the presence of patent or latent friction ridges (fingerprints, palm prints and foot soles). The examination includes a comparison of known prints with unknown prints for individualisation purposes. The presentation of expert evidence in judicial proceedings which include judicial proceedings during disciplinary hearings, arbitration hearings, Magisterial Courts, Regional Courts and High Courts. The above also includes the collection, analysing and classification and processing of the fingerprints using qualified fingerprint technology that meets the minimum standards as listed herein.
Forensic Science Application area	Republic of South Africa
Purpose of the forensic science discipline	To contribute through the application of the forensic fingerprint examination science to judicial processes to a principle of equal justice for all.

4. Standing Operating Procedure

Standard Operating Procedures (SOP's) are organizational unique documents into Fingerprint Examinations, describing the methods, guideline and procedures that should be followed in performing functions aimed at collecting, analysing and reporting on fingerprint evidence for judicial processes. A Fingerprint Examiner should therefore have documented SOP's to ensure that processes are performed consistently.

SOP's are essential to improve the accuracy and quality of the collection and analysis of fingerprint evidence and to implement uniformed processes for conducting Fingerprint Examination tasks in a precise, comprehensive, accurate and judicially acceptable manner. SOP's should consist of both Guidelines and Procedures. The Fingerprint Examiner should have a sound knowledge of all SOP's.

SECTION C

Fingerprint Examination Standard for SA

1. Introduction

Fingerprint examination is not a science in that it is derived from a theory or coherent set of principles and the result of a fingerprint examination is an opinion and not a fact. This requires clear levels of individual competence to be set and complied with, within a framework that is owned and operated by organisations that provide fingerprint examination to the criminal justice system. It also requires evidence that fingerprint methods are valid and that fingerprint evidence is objective and impartial. These are the key elements we see as the basis for setting and maintaining quality standards in fingerprint examination

The objective of the process must be to preserve evidence in its most original form while performing a structured process of collecting, identifying, validating and interpreting digital information for the purpose of reconstructing past events connected with the crime.

2. Investigation Methodology and Reporting

- A Fingerprint Examiner should not accept assignments for which he is not qualified and experienced to conduct.
- A Fingerprint Examiner should be aimed at establishing facts. It could be that there is insufficient evidence to prove the guilt of a party. It is not up to the Fingerprint Examiner to find a person guilty, it is to establish facts and to assist the court in arriving at a correct decision.
- All aspects of a Fingerprint Examiner should be performed in accordance with a documented SOP designed to adhere to these specifications.
- Fingerprint Examination evidence must be collected and managed in such a way that it adheres to the requirements of Section 14 and 15 of the ECT Act, Act 25 of 2002. No actions taken by investigators should change the data which may subsequently be relied upon in court.

- A Fingerprint Examiners may not infringe on a person's right to privacy by accessing data unless dually authorised to do so.
- A Fingerprint Examiner may not access information without the authority to do so and may not access data outside the jurisdiction of SA without authority of the owner.
- Fingerprint evidence must be collected in a reliable manner and it is advisable that it is done in a forensic sound manner, immune to changes or alterations, and that the forensic copy is maintained throughout the Fingerprint Examination process as the original copy of what the data consisted of at the point of collection.
- All processes followed in handling and analysing fingerprint evidence should be auditable and repeatable.
- All phases of a Fingerprint Examination investigation should be performed, documented and reported on to allow the process to be auditable, repeatable and reproducible by a third party independently.
- The Fingerprint Examiner should be able to justify all decisions and actions taken during his investigation.
- If a Fingerprint Examination practitioner is acting as part of a larger investigation or under instruction from an investigator, he must ensure that no person gains access to more information than what they are entitle to in accordance with their mandate or legal instruction.
- Any system error rates should be known to the experts and have been reported.
- The theories and techniques used by experts should enjoy widespread acceptance.
- A Fingerprint Examination expert should not testify on the work product of others without validating facts against the original. General forensic practitioners should not be permitted to testify on digital work product, but must rely on a Fingerprint Examiner to testify on digital evidence.
- A Fingerprint Examiner's report must be of such a detailed level that an external expert could validate and test the findings. Provision is made that different reports could be issued based on the assignment for example:
 - A scene report documenting the actions taken during fingerprint collection

- A findings report – documenting the findings of the analysis to be reported to the client
- An expert report – aimed at being used during a judicial matter

SECTION D

Guidelines when Appointing Fingerprint Examiner

1. *Introduction*

Fingerprint examination has at its core the ability of a competent practitioner to:-

- Understand the structure of skin friction ridge detail and its deposition on a range of substrates.
- Interpret and compare areas of friction ridge detail taking account of the features present and their spatial relationship to each other.
- Make a definitive decision as to whether two areas of friction ridge detail originate from the same person or not.
- Determine that two areas of friction ridge detail contain insufficient detail to make a decision.

Competence in fingerprint examinations can be achieved through a process of learning and developing skills, some of which can quite properly be achieved through external training.

2. *Qualifications, Knowledge & Experience*

There are three categories when it comes to Fingerprint Examiners	
1) Fingerprint Technician - Formal Education	Grade 12 Must be an Electronic Technician accredited by a recognised Service Provider
Education and technical training in forensic fingerprint examination	Basic Computer Literacy Must have done a basic Fingerprint Capturing Training Course through a recognised Service provider
Experience	3 months relating to the capturing of fingerprints
Knowledge	Workable knowledge of the judicial environment

	Workable knowledge of business efficiency
Other Requirements	Must be a member of the ACFE SA, preferably a CFE in good standing
1) Fingerprint Processor – Formal Education	Grade 12 Required to undergo a ten-week training provided by the Police or something similar with an accredited Service Provider
Education and technical training in forensic fingerprint examination	Practical experience in the lifting and classification of fingerprints on the scene
Experience	2 years full time experience in searching and developing of latent fingerprints. Also processing and photographing of developed fingerprints. Have to have knowledge of chain of evidence and evidence gathering and all relevant legislation
Knowledge	Need to have the minimum knowledge regarding the respective legislation relevant Workable knowledge of the judicial environment Workable knowledge of business efficiency
Other Requirements	Must be a member of the ACFE SA, preferably a CFE in good standing
2) Fingerprint Expert - Formal Education	Grade 12 A Bachelor's Degree plus two (2) years of full-time experience, or An Associate Degree (or documentation of 60 semester hours or 90 quarter hours of college credits) plus 3 years of full-time experience as a latent print examiner, or High School Degree plus four (4) years full-time experience as a latent print examiner
Education and technical	Required to undergo a ten-week training provided by the

<p>training in forensic fingerprint examination</p>	<p>Police or something similar with an accredited Service provider</p> <p>Minimum of 160 Hours of Certification Board approved training in latent print matters. Qualifying training programs should be structured as recommended by SWGFAST:” Guideline for training to competency for Latent Print Examiners.</p> <p>Membership of a recognised professional forensic organization.</p> <p>Successfully completed the 8-hour IAI certified latent print test.</p>
<p>Experience</p>	<p>2 years full time or four years part-time experience in latent fingerprint comparison and other latent print matters</p> <p>Court presentation</p> <p>Two (2) years of practical experience in the lifting and classification of fingerprints and;</p> <p>One (1) year full-time experience working in the field</p> <p>Required to have experience in the analysing and comparison of fingerprints</p>
<p>Knowledge</p>	<p>Workable knowledge of the judicial environment</p> <p>Workable knowledge of business efficiency</p> <p>Workable knowledge of the investigation environment</p> <p>Presentation of evidence in judicial processes and workable knowledge of the legal environment</p> <p>Basic knowledge of two classification systems</p>
<p>Other requirements</p>	<p>Must be a member of the ACFE SA, preferably a CFE in good standing</p>

- * The ACFE notes that formal and non-formal prior learning (incorporating experiential learning) may provide functional equivalence to these academic qualifications. As such academic qualifications are regarded as proof of functional, practical and reflective competency, and therefore in this construct demonstrates the minimum competencies required.

Additional requirements:

- Adherence to the ACFE Code of Ethics and Professional Standards;
- Exemplify the highest moral and ethical standards; and
- Abide by the professional CPD / CPE requirements set by the ACFE.

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