

Saint Leo University

CRM341

History and Science of Criminal Identification

Course Description: The focus of this course is the science and history of fingerprint analysis to aid in the detection and prosecution of criminal offenders. Upon successful completion of this course, the student will understand the biology of human epidermal and dermal skin layers to include the formation of pores and the organic and inorganic materials that are commonly found in fingerprint residues; the proper recording and comparison of prints; the many basic and advanced scientific methods currently being employed to develop fingerprints; the development of the print through chemical reaction, chemical absorption, luminescence, or physical attraction; the physics of light energy and its use as a print development method; and the many chemical reactions that produce the developed print.

Prerequisite: CRM230, POL123, CRM220

Textbooks:

Leo, W. (2004). *Fingerprint identification*. Lawtech Custom Publishing. ISBN-13: 978-1-889315-13-3

US Department of Justice. (2008). *The science of fingerprints*. Washington, DC: US Government Printing Office. The link to a free online version is located in the Webliography. ISBN-13: 978-0-16-076078-5

American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: Author. ISBN-13:978-1-4338-0561-5

Additional Required Materials:

Criminalistics Kit – A Saint Leo Student Criminalistic Kit is required for this course. The #CRM341 Criminalistic Kit should be ordered online. Instructions for ordering can be found in Doc Sharing.

Required Lab Assignment Materials:

Supplies for Lab Experiments 1 and 2:

Supplies from your CSI Kit:

- Dual powder
- Fiberglass fingerprint brush
- Black/green magnetic fluorescent powder
- Magnetic powder applicator
- Fingerprint tape
- Fingerprint backing cards
- 7X folding magnifier
- Two pairs of nitrile gloves
- Face mask

Supplies from home:

- Coffee cup
- Two (2) non-porous objects/surfaces (such as a lacquered table, tile, or glass mirror), one "dark" colored and one "light" colored
- Two (2) porous objects/surfaces (such as a wood-grained table, paper from a notebook, or corkboard countertop), one "dark" colored and one "light" colored
- One (1) metal surface (such as an old metal pan or pot)

Supplies for Lab Experiments 3 and 4

Supplies from your CSI Kit:

- Mini SPR processing kit, black (8 oz. SPR, 8 oz. rinse)
- Amido black (aqueous ~ premixed)
- Synthetic blood samples

- Fingerprint tape
- Fingerprint backing cards
- 7X folding magnifier
- Four pairs of nitrile gloves
- Face mask

Supplies from home:

- Two (2) soda pop beverage cans that are dry
- One (1) non-porous object/surface upon which you will place your *synthetic blood sample* (such as a plastic or glass cup)
- Clean up supplies such as paper-towels, dishrags, and dishwashing liquid/soap & water

Supplies for Lab Experiment 5

Supplies from your CSI Kit:

- 7X folding magnifier
- Four pairs of nitrile gloves
- Fingerprint pad (inkless)

Supplies from home:

- Several sheets of 8x12 sized paper
- Alcohol wipes (or soap and water)
- Ruler
- Pen or pencil
- Table to work on
- Heavy rectangular object (for weight)
- Print-out of FBI "Guide to Taking Legible Fingerprints"
- Someone to fingerprint (optional)

Learning Outcomes:

As a result of this course, students will:

1. Demonstrate an understanding of the Saint Leo University core value of *Excellence* as it relates to criminal identification.
2. Discuss the history and science underpinning the theory of criminal identification using fingerprints.
3. Analyze how fingerprints are deposited at crime scenes and how this relates to human physiology.
4. Apply methodologies used in print residue recovery.
5. Identify skills needed to interpret and identify fingerprint patterns.
6. Discuss pitfalls encountered in courtroom testimony related to fingerprint evidence.
7. Relate the chemical make-up of fingerprints and how this impacts scientific method.

Core Value Focus:

Excellence: Saint Leo University is an educational enterprise. All of us, individually and collectively, work hard to ensure that our students develop the character, learn the skills and assimilate the knowledge essential to become morally responsible leaders. The success of our University depends upon a conscientious commitment to our mission, vision and goals.

Evaluation:

Grades will be based on the following: Total possible points = 1000

Evaluation Activity	Points	Percentage (%)
Exams	400 pts (4 @ 100 pts each)	40
Written Research Paper	100 pts	10
Discussion Question Postings	300 pts (8 @ 37.5 pts each)	30
- original 25 pts each		
- both responses 12.5 pts		

Lab Experiment Postings	200 pts (5 @ 40 pts each)	20
Total	1000	100

Grade % (score)

A	94-100	C+	77-79
A-	90-93	C	74-76
B+	87-89	C-	70-73
B	84-86	D+	67-69
B-	80-83	D	60-66
		F	0-59

Assignments: **NOTE ~ All work is individual unless specifically noted as a group assignment**

Exams

Exams consist of multiple choice and short-answer questions based on the readings, assignments, and lecture notes from the instructor. *Each is worth 10% of the final course grade.*

Discussion Question Postings/Responses

Students are expected to participate fully in each class module. Participation includes an initial response to the discussion question followed by substantial replies to at least two classmates. *Discussion assignments are collectively worth 30% of the final course grade.*

Physical Lab Assignments

Students will participate in five (5) experiments demonstrating their understanding of the course material. Completing several "real world" practical experiments involving processing of items of "evidence" for latent fingerprints, as well as learning the skills of collecting and taking inked fingerprints, will offer students the opportunity to showcase their educational intellect and competency of the material as well as recognize their ability to complete a case to its successful resolution. *Each of the physical lab assignments are worth 4% of the final course grade.*

Research Paper:

Each student will complete a written five (5) page Research Paper. The student will submit a research paper that discusses a **fingerprint detection method utilized as the PRIMARY evidentiary material in a court case**. Examples of such cases include the Brandon Mayfield case (Madrid Train Bombing), the Stephen Cowens case, the case of Thomas Jennings, or the "Night Stalker" Richard Ramirez. These are but a sample of the types of cases accepted; you will require your specific topic approval from your instructor.

The completed research paper will include the following:

- Use 12-point font, double-spaced format, and one-inch margins throughout the paper.
- Length should be approximately five (5) pages long (this does not include your title page or references).
- Paper will include a header (i.e., the shortened title of paper and page number).
- APA regulations require a reference page including all references ascribed to in paper; properly cite the sources both in the body of the paper and on a separate "References" page.
- Paper must include **two (2) scholarly references** (i.e., peer-reviewed scholarly journal articles) **AS WELL AS one (1) textbook**, of which the course text is allowed. Other popular journals or legal research websites (such as WESTLAW) will be acceptable but should be considered secondary references ***in addition to*** the two scholarly journal references and textbook reference. If you are uncertain as to what a "scholarly journal source" represents, please make certain to contact the Library so they may assist you.

The research paper is due in **Module 7**. Understanding the importance of individual fingerprint identification within the criminal justice system requires the student to identify their ability to excel in the face of a judicial challenge while maintaining their integrity in articulating results and evidence.

Grading Rubric CRM 341: Research Paper

It is expected that the student will devote a great deal of initiative toward producing a quality product worthy of the high academic standards established at Saint Leo University. This research paper will represent **10%** of the final course grade.

The paper will be evaluated based on the following criteria:

- a. **Thoroughness:** How extensively does the paper develop the issue? Does the student show depth and understanding of the subject, or is the analysis superficial? Does the paper clearly identify its focus and logically analyze and discuss the topic?
- b. **Scholarly quality:** Does the assignment meet acceptable college level standards with respect to form and substance (APA)? Are the ideas presented in a clear, concise manner with a logical progression? Are resources properly cited in the body of the paper and then listed on the "reference" page? Are there numerous typographical, spelling, or grammatical errors? (Each such error deducts points off the grade).

Ratings

- **Exceptional:** Performance is outstanding; significantly above the usual expectations
- **Proficient:** Skills and standards are at the level of expectation
- **Basic:** Skills and standards are acceptable but improvements are needed to meet expectations well
- **Novice:** Performance is weak; the skills or standards are not sufficiently demonstrated at this time
- **Null:** This criterion is missing or not in evidence

Criteria		Ratings				
		Null	Novice	Basic	Proficient	Exceptional
The paper extensively develops the issue (<i>Excellence Core Value</i>)	10 pts	0	7	8	9	10
Ideas are presented in a clear, concise manner (<i>Excellence Core Value</i>)	10 pts	0	7	8	9	10
Shows depth and understanding of the subject matter with appropriate analysis of fingerprint examination concepts and their effect on the FS community	20 pts	0	14	16	18	20
Clearly identifies focus of research/case and logically analyzes the topic, referring to research and/or cases which utilize the technique or analysis method	20 pts	0	14	16	18	20
Meets acceptable college level standards with respect to form and substance – meets APA Style requirements	20 pts	0	14	16	18	20
Typographical error-free; typed in a double-spaced format with bibliographic references; and plagiarism-free	20 pts	0	14	16	18	20

Comments:

Score: ____ of 100

Written Assignments and the APA Format:

The Department of Criminal Justice recognizes the value of excellence in writing for students in Criminal Justice. In part, each professor is expected to provide guidance on improving a student's writing skills. Students are required to use only the APA (American Psychological Association) format to write and develop a scholarly paper for submission in the Social Sciences. APA has been adopted by the Department as its writing standard for all academic written assignments. No other writing style is acceptable.

APA is the American Psychological Association, and the style is one of many in the academic world used to regulate the language, citations, procedure, and formatting of manuscripts and other examples of writing in the social sciences. Please be consistent throughout each written paper. *Refer to APA Guide under Resources on the Course Menu for APA specifics.*

All projects, assignments, or papers submitted for grading will be required to include an abstract and reference page. All references are to be cited using the American Psychology Association (APA) format (6th edition). Other formats will not be accepted. For each scholarly paper and group assignment(s), the

work will be assessed using an individual grading rubric for each assignment. This tool and process helps the students identify and professor measure the key points necessary to successfully complete written or group assignments. *Wikipedia is not an appropriate source for any scholarly writing and is not permitted for any assignment in this program.*

Schedule of Objectives and Assignments

Module 1 Course Overview: History of Fingerprint Science & Biology of Friction Ridge Skin & Pores

Outcomes:

After completing this module the student will be able to:

- List the most recognized contributions and contributors to fingerprint identification
- Identify and explain how friction skin is formed and what are the major areas of the hand
- Explain the connections between the science of biology and the criminal justice system

Assignments:

Assignment	Due no later than
Post Introduction to discussion board	Thursday 11:59 PM EST/EDT
Read the assigned materials	
Read USDOJ Chapter 1: History in <i>The Fingerprint Sourcebook</i> by the US Department of Justice in the Webliography	
Read "Verifying and Evaluating Online Sources" on the Cannon Memorial Library website	
Post Initial response to discussion question	Thursday 11:59 PM EST/EDT
Post Responses to at least two classmates	Sunday 11:59 PM EST/EDT
Begin Working on research topic	Module 2
Complete Exam 1 covering material from Module 1	Sunday 11:59 PM EST/EDT

Module 2 Introduction to Print Residue: Organic/Inorganic Components and Methods of Development/Conditions for Deterioration

Outcomes:

After completing this module the student will be able to:

- Define the composition of latent fingerprints
- Contrast the difference between the three types of evidence prints which can be found at crime scenes
- Describe and then contrast the difference between fingerprint comparisons and fingerprint exclusions
- Describe the methodology used by fingerprint examiners when conducting print examinations

Assignments:

Assignment	Due no later than
Read the assigned materials	
Post Initial response to discussion question	Thursday 11:59 PM EST/EDT
Post Responses to at least two classmates	Sunday 11:59 PM EST/EDT
Submit Research topic	Sunday 11:59 PM EST/EDT
Complete Exam 2 covering material from Module 2	Sunday 11:59 PM EST/EDT

Module 3 Print Development: Mechanical Methods

Outcomes:

After completing this module the student will be able to:

- Explain the concept of why fingerprints develop on certain surfaces
- Relate the mechanics of latent print development with powders and brushes
- Elaborate upon the importance of proper documentation of evidentiary prints for ensuring integrity of evidence
- Compare and contrast the use of black powder versus fluorescent powder for latent prints

Assignments:

Assignment	Due no later than
Read the assigned materials	
Read Chapter XIII in <i>The Science of Fingerprints</i>	
Post Initial response to discussion question	Thursday 11:59 PM EST/EDT
Post Responses to at least two classmates	Sunday 11:59 PM EST/EDT
Post Synopses of Lab Experiments 1 and 2 (Black/Fluorescent Powders)	Sunday 11:59 PM EST/EDT

Module 4 *Print Development: Chemical Methods*

Outcomes:

After completing this module the student will be able to:

- Compare and classify the various types of chemical methods for developing latent prints
- List different chemical reactions that result in latent print development
- Classify the different chemical processes for porous and non-porous surfaces

Assignments:

Assignment	Due no later than
Read the assigned materials	
Read Chapter XIV in <i>The Science of Fingerprints</i>	
Read Latent Fingerprint Processing Techniques Casting a Wide Net: Lifting Fingerprints from Difficult Surfaces Aqueous Amido Black, Forensi-Tech Limited Small Particle Reagent	
Post Initial response to discussion question	Thursday 11:59 PM EST/EDT
Post Responses to at least two classmates	Sunday 11:59 PM EST/EDT
Post Synopses of Lab Experiments 3 and 4 (SPR and Amido Black)	Sunday 11:59 PM EST/EDT

Module 5 *Fingerprint Classification*

Outcomes:

After completing this module the student will be able to:

- Compare and classify the various types of fingerprint patterns
- Distinguish amongst the various terms used for fingerprint classification
- Classify fingerprints using the Henry system
- Classify fingerprints using the NCIC system

Assignments:

Assignment	Due no later than
Read the assigned materials	
Read Chapters IV, V, VI, and VII in <i>The Science of Fingerprints</i>	
Post Initial response to discussion question	Thursday 11:59 PM EST/EDT
Post Responses to at least two classmates	Sunday 11:59 PM EST/EDT
Complete Exam 3 covering material from Modules 3, 4, and 5	Sunday 11:59 PM EST/EDT

Module 6 Collecting and Taking Inked Fingerprints

Outcomes:

After completing this module the student will be able to:

- Evaluate the uses of recorded finger and palm prints for identification
- Explain the ramifications of poorly recorded finger and palm prints
- Experiment with the process of how to correctly record a fingerprint “ten-print” card

Assignments:

Assignment	Due no later than
Read the assigned materials	
Read Chapter VIII, IX, and X in <i>The Science of Fingerprints</i>	
View: Chart: Capturing Legible Fingerprints Quick Tips, Module 6 Content Video: Recording Fingerprints for Ten Print Submission, Module 6 Content Video: How to Take Successful Eelctronic Prints, Module 6 Content	
Post Initial response to discussion question	Thursday 11:59 PM EST/EDT
Post Responses to at least two classmates	Sunday 11:59 PM EST/EDT
Submit Synopsis of Lab Experiment 5 (Inked Fingerprints)	Sunday 11:59 PM EST/EDT

Module 7 AFIS, Live Scan®, and Courtroom Applications

Outcomes:

After completing this module the student will be able to:

- Evaluate how fingerprint evidence is used in the criminal justice system
- Explain the reliability and scientific validity of fingerprint evidence in the courts
- Explain how the AFIS system is used to automate fingerprint records
- Discuss the advantages and disadvantages of various types of fingerprint courtroom exhibits

Assignments:

Assignment	Due no later than
Read the assigned materials	
Read Chapter XVI in <i>The Science of Fingerprints</i>	
<i>Explore On the Web</i> : Find a case involving fingerprint evidence (for your discussion question)	
Post Initial response to discussion question	Thursday 11:59 PM EST/EDT
Post Responses to at least two classmates	Sunday 11:59 PM EST/EDT
Submit Research paper	Sunday 11:59 PM EST/EDT

Module 8 *Ethical Responsibilities of Fingerprint Examiners*

Outcomes:

After completing this module the student will be able to:

- Assess the value and importance of remaining impartial in investigations and analysis
- Explain why friction skin identification is an objective scientific discipline
- Justify why fingerprint examiners are held to such a high expectation of conduct and why they must maintain such a high level of competence
- Discuss why identification standards are necessary for the field of print comparison

Assignments:

Assignment	Due no later than
Read the assigned materials	
Post Initial response to discussion question	Thursday 11:59 PM EST/EDT
Post Responses to at least two classmates	Sunday 11:59 PM EST/EDT
Complete Exam 4 covering material from Modules 6, 7, and 8	Sunday 11:59 PM EST/EDT