WE '00
JM

PHYSICAL FORENSIC SCIENCE
FS 333
CLASS SCHEDULE

DATE	TOPIC	INSTRUCTOR	READING
1/11/00	**Introduction to Forensic Science**	Jim **JOSEY**	Chapter 1
1/13/00	**Questioned Documents** Identification of Handwriting Methods of obtaining specimens	Jim **JOSEY**	Chapter 16 & Handouts
1/18/00	Identification of Handwriting	Jim **JOSEY**	
1/20/00	Identification of Paper, Writing Instruments, Inks, Typewriting Photocopiers and Computer Generated Documents	Jim **JOSEY**	
1/25/00	**Quiz 1** (50 points) Restoration of Obliterated and Erased Writings, Unusual Questioned Document problems	Jim **JOSEY**	
1/27/00	**Footwear and Tire Print Identification** Recovery Techniques Types of Comparisons Preparing Known Specimens Comparison Procedures Types Opinions	Jim **JOSEY**	Pages 492-499
2/1/00	**Firearms and Toolmarks** Comparison Microscope Bullet & Cartridge case ID Drugfire & IBIS systems Distance Determination Recovery of Firearm Evidence	Curtis **KUBO**	Pages 188-189 Chapter 15
2/3/00	**Quiz 2** (50 points) Serial Number Restoration Toolmark Identification Misc.examinations	Curtis **KUBO**	

2/8/00	**Introduction To Trace Evidence Analysis** Inorganic Analysis	Tracy **TANAKA** Claire **CHUN**	Chapter 6
2/10/00	The Microscope Hair Examinations	Tracy **TANAKA** Claire **CHUN**	Chapters 7 & 8
2/15/00	Fiber Examinations	Tracy **TANAKA** Claire **CHUN**	Chapter 8
2/17/00	**Quiz 3** (50 points) Paint Examinations	Tracy **TANAKA** Claire **CHUN**	Chapter 8
2/22/00	Glass Examinations	Tracy **TANAKA** Claire **CHUN**	Chapter 4
2/24/00	Gunshot Residue and Explosives Examinations	Tracy **TANAKA** Claire **CHUN**	Chapters 11 & 15
2/29/00	Fire Debris Examinations	Tracy **TANAKA** Claire **CHUN**	Chapter 11
3/2/00	**Introduction to Drug Identification** Chomatography Methods	Judy **CHRISTENSEN**	Chapter 5
3/7/00	Spectrophotometry Methods Mass Spectrometry	Judy **CHRISTENSEN**	Chapter 5
3/9/00	**Quiz 4** (50 points) Class of Controlled Substances	Judy **CHRISTENSEN**	Chapter 9
3/14/00	Controlled Substances (con't)	Judy **CHRISTENSEN**	Chapetr 9
3/16/00	Techniques used in Drug Identification	Judy **CHRISTENSEN**	Chapter 9
3/21/00	**FINAL EXAM** (200 Points) Cummulative.	Jim **JOSEY**	

QUESTIONED DOCUMENTS

I. Introduction

A. Purpose

1. To acquaint the student with the procedures and techniques used in the examination of Questioned Documents.

B. Areas to be Studied

1. Identification of Handwriting and Handprinting
2. Methods of Obtaining Useful Handwriting Specimens
3. Identification of Paper
4. Identification of Writing Instruments
5. Identification of Inks
6. Identification of Typewriting, Computer Generated Copies and Photocopiers
7. Unusual questioned document problems

C. Types of Questioned Documents

1. Checks, Drafts, Bank Notes, Credit Card Invoices, etc.
2. Robbery notes, Suicide notes, Extortion Letters, etc.
3. Wills, Deeds, Powers of Attorney, Titles, Contracts
4. Invoices, Bills of lading, etc.
5. Personal Letters, Notes or Correspondence

D. Typical Reasons Why Documents Are Questioned

1. Origin-
2. Content-
3. Prejudice-
4. Circumstances of Production-

II. What is a Forensic Documents Examiner?

A. Professional Requirements

1. Education
2. Training Period

B. Areas of Study and Expertise

1. Identification of Paper.
2. Identification of Inks.
3. Identification of Writing Instruments.
4. Identification of Typewriters.
5. Identification of Printing Processes.
6. Identification of Photocopiers.
7. Identification of Printing or Imprinting Devices.
8. Deciphering Indented Writings.
9. Deciphering Obliterated, Erased or Altered Writings.
10. Detection of Forgeries and Counterfeit Instruments.
11. Identification of Handwriting and Handprinting.
12. Other Misc. Questioned Document Related Problems.

C. What is Graphology

1. Definition -

_____

_____

2. Uses in Criminal Investigations -

_____

_____

_____

III. Identification of Handwriting

A. What can be said about handwriting with any degree of certainty.

1. _____

2. _____

3. _____

4. _____

B. Other Comments

1. What cannot be said about handwriting.

(a)	Sex	(d)	Age
(b)	Race	(e)	Personal Traits
(c)	Intelligence	(f)	Emotional Stability or Condition

2. Special Effects on Handwriting

(a) illness, age, position of writer, writing surface, strenuous exercise, injury, intoxication.

C. Necessary Elements For a Successful Identification.

1. _____

2. _____

(a) Known Writings - _____
_____
_____

(b) Collected Writings - _____
_____
_____

D. What cannot be compared.

1. Handprinting with Handwriting
2. Numbers with Letters
3. Unlike Letter and Number Combinations

E. The Examination Process

1. The Manhunt System

(a) Class characteristics - _____
_____
_____

(b) Individual Characteristics - _____
_____
_____
_____

2. What is considered

   (a) Letter Forms, System of Writing, Movement, Muscular Habits, Skill, Instrument, Pen Position, Line Quality, Shading, Retrace, Straight Lines, Curves, Angles, Proportion, Averages and Deviations, Connections, Spacing, Terminals, Slant, Alignment, Arrangement, Punctuation, Embellishments, Trademarks, etc.

3. Equipment Used

   (a) Magnification Equipment
   (b) Special Lighting
   (c) Infrared and Ultra-violet Lighting
   (d) Special Grids
   (e) Special Measuring Devices

4. Examination of the Questioned Writings

   (a) Detection of Disguise - _____

   _____

   (b) Types of Forgeries

      (1) Freehand - NO ATTEMPT TO IMITATE THE GENUINE SIGNATURE OR WRITING.

      (2) Simulations From Memory - FORGER HAS SOME KNOWLEDGE OF WHAT THE GENUINE SIGNATURE OR WRITING LOOKS LIKE AND ATTEMPTS TO IMITATE IT WITHOUT USING A MODEL

      (3) Simulations From Model - FORGER USES A MODEL WHEN COPYING THE SIGNATURE OR WRITING.

      (4) Tracings - SIGNATURE OR WRITING IS TRACED USING A MODEL SIGNATURE. CANNOT BE IDENTIFIED WITH A PARTICULAR WRITER.

   (c) Unique Characteristics and Features

5. Examination of the Known and Collected Writings

   (a) Detection of Disguise - _____

   _____

   (b) Unique Characteristics and Features

6. Side by side comparison of the Questioned Writings with the Known and Collected Writings

   (a) Similarities

   (b) Dissimilarities

   (1) Normal Variations - WITHIN AN ACCEPTABLE RANGE OF VARIATION.

   (2) Unexplained Variations - THOSE VARIATIONS WHICH CANNOT BE EXPLAINED USING THE KNOWN OR COLLECTED WRITINGS BUT ARE STILL NOT DIFFERENCES.

   (3) Differences - THOSE FEATURES WHICH INDICATE ANOTHER WRITER.

F. Procedures

1. Collecting Evidence

   (a) _____
   _____
   _____

   (b) _____
   _____

   (c) _____
   _____
   _____

2. Taking Specimen Handwritings

   (a) Your approach and attitude can be critical

   (b) Schedule an ample amount of time

   (c) Selecting a place to take specimens

   (d) NEVER SHOW THE CONTRIBUTOR THE QUESTIONED WRITINGS BEFORE OR DURING THE INTERVIEW AND TAKING OF THE SPECIMENS

   (e) Ask for some identification with a signature and make a photocopy of it. If possible obtain some known handwriting of the contributor to assist in detecting disguise in the specimens you are about to take.

(f) Make sure the writing surface is smooth and clear of obstructions.

(g) Selection of the writing instrument -

(h) The Handwriting Questionnaire -

The Handwriting Specimen Sheet -

(i) Similar Forms and Format -

(j) Dictating the specimen writings

(k) When to dictate spelling -

(l) Opposite Hand Specimens -

(m) Witnessing the specimen writings -

3. Obtaining Collected Writings

(a) Sources - CANCELED CHECKS, EMPLOYMENT APPLICATIONS, CREDIT APPLICATIONS, DRIVERS LICENSE APPLICATION, FINGERPRINT RECORDS, POLICE REPORTS, ETC.

(b) Should be contemporaneous with the questioned writings.

(c) Content - SHOULD CONTAIN COMPARABLE WORD, LETTER AND NUMBER COMBINATIONS AS THOSE IN THE QUESTIONED TEXT.

(d) Authentication - MUST BE ADMITTED TO AS HAVING BEEN WRITTEN BY THE CONTRIBUTOR OR SOMEONE WHO ACTUALLY SAW THE CONTRIBUTOR WRITE THE TEXT.

4. Submitting the Laboratory Work Request.

(a) Identify the Questioned Documents and the Known Specimens.

(b) Identify the person who wrote the Known Specimens.

(c) Statement of what you have done.

(d) Be sure all Questioned Documents and Known as well as Collected Writing to be used in the comparison are turned over to the Evidence Custodian prior to forwarding the request to the Crime Lab.

5. The Document Examiner's Presentation of Evidence in Court

a. Dean Wigmore's statement regarding evidence -

EVIDENCE SHOULD BE MEASURED BY ITS CONVINCINGNESS.

b. Pre-Trial conference with the Prosecuting Attorney

(1) List of qualifications and qualification questions.

(2) What to introduce and how to introduce.

(3) Order of Presentation.

(4) Introduction of Charts, Photographs or other aids.

c. Testimony

(1) Direct Examination

(a) Qualifications

(b) Introduction of Evidence

(c) Examination Results

(d) Presentation to the Jury

(2) Cross Examination

(a) Stay within the scope of direct examination.

(b) Avoid giving opinions on exemplars provided by the defense under cross examination for the sole purpose of proving his/her own contentions.

IV. Other Forensic Examinations of Questioned Documents

A. Identification of Paper

1. What is Paper?

   a. Thin sheet of matted vegetable fiber, usually wood pulp plus a mineral filler, such as clay or titanium dioxide and a sizing such as rosin or starch and synthetic dyestuffs.

2. What can you say about paper?

   a. SOURCE

   b. CHEMICAL MAKE UP

   c. DIFFERENCE FROM OTHER PAPERS

3. Ordinarily you cannot resolve the exact age of paper.

4. Considerations in the Examination of Paper

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

5. Detecting Rubber Erasures on Paper

   a. Microscopic examination

   b. Chemical/Physical Tests

6. Collecting Paper as Evidence

   a. Use a protective envelope

   b. Avoid exposure to
      (1) light
      (2) air
      (3) handling

7. Definite Conclusions Regarding Examinations of Paper as Evidence

a. Identifies the common origin of two papers and only classifies such papers as coming from the same manufacturing lot or group.

B. Identification of Writing Instruments

1. What Can Be Said About Writing Instruments

a. Whether or not a particular pen was on the market at a specific time.

b. Whether or not a particular kind of pen was used to execute a questioned writing

2. Types of Writing Instruments

a. Pencils

(1) CARBON LEAD - CLAY AND GRAPHITE

(2) LIQUID LEAD - FREE FLOWING INK

b. Ball Point Pens

(1) FIRST INTRODUCED OCTOBER 29, 1945

(2) PRIMARILY GRAVITY BASED FUNCTIONS

c. Fiber Tip Pens - FREE FLOWING INK

(1) NYLON TIP

(2) FELT TIP

(3) ROLLER BALL - PLASTIC, METALLIC

(4) RAZOR TIP

d. Fountain Pens

(1) FREE FLOWING INK

(2) NIB

3. Handling Writing Instruments as Evidence

a. Use same general methods as used in gathering other types of evidence

b. Protect tip from exposure

c. Identification of Inks

1. What You Cannot Say About Inks

a. What particular pen the ink came from

b. The exact age of the ink

2. What You Can Say About Inks

a. The identity of the chemical and organic composition.

b. Whether or not two or more inks are similar or different.

3. Types of Inks

a. Iron Base Inks - Commonly referred to as Iron Nutgall Inks.

(1) PLANT SOURCE

(2) BLUE-BLACKS

(3) PERMANENT REACTING

b. Water Base Inks - Non-permanent reacting

(1) SYNTHETIC DYE INKS - ALSO KNOWN AS LOGWOOD INKS, MADE FROM IRON, CHROMIUM AND COPPER.

c. Carbon Inks - Most permanent reacting

(1) INDIA INK

(2) DRAWING OR LETTERING INK

4. Types of Ink Writing Media

   a. FIBER POINT - WATER BASED INKS

   b. BALL POINT - THICK MIXTURE OF SEVERAL TYPES OF INKS

   c. LIQUID LEAD - COMBINATION OF BALL POINT PEN INK AND GRAPHITE AND CLAY

5. Testing of Inks

   a. Non-Destructive

      (1) Microscopic

      (2) Infrared and Ultraviolet Examination

      (3) Laser Light Examination

   b. Destructive

      (1) Water/Chemical

      (2) Chromatographic

      (3) Spectroscopy

6. Special Testing Labs

   a. U.S. Secret Service

   b. U.S. Dept. of A.T.F. - This agency has the special capability of dating ball point pen inks.

7. Handling Ink as Evidence

   a. Use caution on collecting inked items.

      (1) _____

      (2) _____

      (3) _____

      (4) _____

      _____

D. Identification of Typewriting

1. History of Typewriting

a. 1874 - The first typewriter was made available to the public and was the Remington Model 1.

b. 1906 - First portable typewriter was manufactured by Standard Folding.

c. 1921 - First electric typewriter was manufactured by Mercedes of Germany. Remington and Woodstock also had electric typewriters in the early 1920's.

d. 1950's - Smith Corona made the first portable electric typewriter.

e. 1960's - First Japanese typewriters were made.

f. 1961 - The first I.B.M. Selectric was marketed.

g. 1970's - Proportional Spacing and Self-Correcting Typewriters were introduced.

h. 1980's - Thermal Head Typewriters were introduced.

2. What Can Be Said About Typewriting

a. _____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

3. Fundamentals of Typewriter Identification

a. Type Face

(1) Pica - 10 CHARACTERS PER INCH
(2) Elite - 12 CHARACTERS PER INCH
(3) Proportional- EACH CHARACTER ASSIGNED ITS OWN SPACE

b. Defects

(1) Typeface - Broken serifs and fonts

(2) Alignment - Character alignment, high, low, right, left, etc.

c. Testing for Altered Typewritten Documents

(1) Use a test plate to check alignment of characters.

(a) Vertical Alignment - Conventional American typewriters have six lines to an inch.

d. Letter Designs

(1) Measure from center staff on "W", "M", etc.

e. Dirty Type Face

4. Problems in Identification of Typeface with Machines

a. Interchangeable typing elements

b. The use of common suppliers for most typewriter companies.

5. Gathering Typewriting Evidence

a. _____

b. _____
_____
_____
_____

c. _____

d. _____
_____

E. Identification of Other Types of Printed Matter

1. Computer Printers

a. Impact

(1) Metal Surfaced Type Face

(2) Plastic Surfaced Type Face

b. Non-Impact

(1) Ink Jet

(2) Thermal

(3) Laser

2. Photocopiers

a. Types

(1) Direct-Electrostatic - PAPER IS CHARGED AND IMAGE APPLIED DIRECTLY TO THE PAPER.

(2) Indirect-Electrostatic - SURFACE OF DRUM IS CHARGED AND IMAGE IS TRANSFERRED TO THE PAPER.

(3) Dual - ONE SHEET OF PAPER IS EXPOSED TO THE IMAGE AND THEN BROUGHT INTO CONTACT WITH A SPECIALLY TREATED PAPER ON WHICH THE IMAGE IS TRANSFERRED.

(4) Thermal - SPECIAL TREATED PAPER IS PUT IN CONTACT WITH THE ORIGINAL AND THE IMAGE IS TRANSFERRED USING A HEAT PROCESS.

b. What can be said about photocopied evidence

(1) Make and Model of possible photocopier used to produce the questioned photocopy

(2) Generation of Copy

(3) Possibility of identification of a particular copier used to produce the questioned photocopy

c. Collecting Photocopied Evidence

(1) Avoid any unnecessary handling.

(2) Place in a paper envelope.

(3) Avoid exposure to light, heat or moisture.

d. Obtaining Specimens for Photocopier Comparison

(1) List all suspect photocopiers by make, model and serial number.

(2) Obtain service and maintenance records for each suspect copier.

(3) Obtain a minimum of five specimen copies from each suspect copier by copying from a plain sheet of paper.

(4) Obtain five copies of the surface of the cover door.

F. Identification of Imprinting or Stamping Devices

1. Rubber Stamps

a. Types

(1) RUBBER

(2) POLYETHYLENE/PLASTIC

b. Defects

(1) MANUFACTURER

(2) WEAR OR DAMAGE

2. Checkwriters or Signature Facsimile Devices

a. Inked

b. Ribbon

c. Defects

(1) ALIGNMENT

(2) DAMAGE AND WEAR

G. Unusual Questioned Document Problems

1. Indented Writing

   a. Kinds of Documents Which May Produce Indented Writings

      (1) Robbery or Extortion Notes or Letters

      (2) Threatening or Harassing Notes or Letters

      (3) Obscene Notes or Letters

      (4) Any correspondence or other document in which the proof of the identity of the author is critical to the case

   b. Methods of Detection

      (1) Non-Destructive

         (a) Oblique Lighting

         (b) ESDA

   c. Destructive

      (1) Chemical

   d. Collecting and Preserving Evidence with Suspected Indented Writing

      (1) Place evidence in a protective envelope.

      (2) Do not write on anything on top of the questioned document.

      (3) Protect document from exposure to heat or moisture.

      (4) Do not allow the questioned document to be treated with any chemical prior to an examination for indented writing by the Documents Examiner.

2. Obliterated Writings

a. Types

(1) Scribbled or overwritten

(2) Masked

b. Methods of Deciphering

(1) Non-destructive

(a) Transmitted Light

(b) IR/UV examination

(c) Magnified photography and tracing

(2) Semi-Destructive (Masked Obliterations)

(a) Non-Altering Chemical

(3) Destructive (Masked Obliterations)

(a) Chemical

(b) Physical

H. Counterfeit Documents

1. Printing Processes

a. Letterpress - Also known as relief printing. The printing surface is raised above the surface of the printing plate.

(1) facial embossing

(2) ink build-up around printed characters

(3) irregular inking of printed characters

b. Intaglio - Also known as engraved printing. The printing surface is below the surface of the printing plate.

(1) ink is raised above the paper surface

(2) reverse embossing may be present

(3) may observe "sawtooth" edges on printed characters

c. Planographic - Also known as lithography. The printing surface is essentially on the same plane as the printing plate.

(1) no facial or reverse embossing

(2) no ink build-up

(3) uniformity of inking

(4) sharp and crisp edges

d. Screen - Also known as stencil printing. A mechanical or photo-mechanical "screen" is used essentially as a printing plate.

(1) heavy ink build-up on surface of paper

(2) no embossing, facial or reverse

(3) fabric or wire pattern frequently observable in the surface of ink or in the edge of printing.

e. Thermographic -

(1) ink is placed on paper by a printing process (ie: letterpress or lithography)

(2) thermoplastic particles are fused over printing in the form of a clear coating

(3) no actual embossing occurs, if lithography is used prior to fusing

(4) printed product has glossy, reflective appearance

(5) toner material can most readily be observed on edges of printed characters

2. Counterfeit Currency

a. Detection

(1) Paper - Red and Blue Fibers

(2) Ink - Magnetic properties

(3) Printing - Intaglio

(4) Check Letter Test

(5) Side by side comparison with a genuine bill of the same denomination and series

b. Handling the Evidence

(1) Handle carefully

(2) Place in a protective envelope

c. Role of the Secret Service

3. Counterfeit Checks

a. Detection

(1) Paper - Often poor quality paper

(2) Ink - May be smeared or of low quality

(3) Printing - Poor quality and detail. Often misaligned.

(4) Bank Routing Indicators and Federal Reserve Routing Codes may not agree

(5) Logos - Poor quality. Sometimes stamped using a rubber stamp.

(6) Check Numbers misaligned or duplicated

(7) Writing on the face may be similar to second part endorsement on the back

b. Handling the Evidence

(1) Handle carefully

(2) Do not staple or fold

(3) Place in a protective envelope

4. Counterfeit Travelers Checks

a. Detection

(1) Paper is often of poor quality

(2) Planchettes in the paper are printed rather than randomly placed

(3) Ink is often smeared or discolored

(4) Serial numbers are often poorly printed

(5) Overall printing detail is of poor quality

(6) Smear test (American Express)

(7) Hologram Designs

(8) Side by side comparison with a genuine check

5. Counterfeit Identification

a. Detection

(1) Identification Reference Manual available in the Crime Lab

6. Counterfeit Credit Cards

   a. Detection

      (1) Side by side comparisons with a genuine card from the same company

      (2) Embossing may be irregular and of poor quality

      (3) Plastic may be poor quality and lamination may be defective

      (4) Hologram symbol defective

   b. Handling as Evidence

      (1) Avoid excessive handling and exposure

      (2) Place in a protective envelope

7. Counterfeit Stocks and Bonds

   a. Detection

      (1) Paper sometimes poor quality

      (2) Planchettes will be printed rather than randomly placed

      (3) Ink will sometimes be smeared or discolored

      (4) Printing process used may be of poor quality and detail

      (5) Check Serial Numbers with the Security and Exchange Commission

   b. Role of FBI and other federal agencies