

# JOHN JAY COLLEGE OF CRIMINAL JUSTICE

524 West 59<sup>th</sup> Street, NY NY 10019

**FOS 313, Section 01**

**Spring 2013**

## **An Introduction to Criminalistics for Forensic Science Majors**

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Office Hours: M & W 1230-1330hrs; T 1330-1430 OR by appointment

Class Meets from 1450 to 1730hrs (2:50pm to 5:30pm)

### **Course Description**

This course provides an introduction to the problems and techniques of the scientific examination of physical evidence with emphasis on the documentation and interpretation of physical patterns. Review of the theoretical bases of methods of comparison and their influence on scientific interpretation. Discussion of ethics and professional standards in forensic science. FOS 313 is designed to prepare the forensic science student for the upper level major courses by teaching the fundamental principles needed to commence advanced study. These include the scientific method, practical problem solving and documentation appropriate for scientific and legal purposes.

### **Learning outcomes**

#### *Reasoning*

- Work through basic forensic science problems which require the application of knowledge from foundational science courses.
- Learn to treat laboratory samples as actual evidence and learn to analyze the sample alongside controls and to properly document the experimental process from data acquisition and interpretation to the reporting of results and conclusions, dealing with the nuances of “real world” types of samples which require both creative and critical thinking skills.
- Apply their knowledge to the analysis of prepared “evidence” and to draw appropriate scientific conclusions based on data and experimental results.

#### *Knowledge*

- Analyze and interpret many types of physical pattern evidence, including fingerprints, footwear outsole patterns, and blood spatter patterns.
- Understand the material nature of physical evidence such as hairs, fibers, fingerprints, firearms and footwear evidence as well as the physical methods used to analyze such evidence

#### *Practical skills*

- Use the following laboratory skills and experimental techniques: basic microscopy, species of origin hair analysis, basic blood spatter pattern analysis, latent fingerprint development techniques, footwear outsole exemplar preparation and casting footwear impressions, gunshot residue analysis for distance determinations.

- Appreciate the importance of accreditation and certification in forensic science, ethical issues in scientific testimony, and of using appropriate controls in their laboratory experiments.

### *Communication*

- Critically analyze a research article from a peer reviewed journal and assess the article for the experimental design, the appropriateness of the authors' conclusions and the impact of such research on forensic science.

### **Course References**

Textbook (Required):

Fisher, B.A.J., Tilstone, W.J., & Woytowicz, C. (2009). *Introduction to Criminalistics: The Foundation of Forensic Science*. Burlington, MA: Elsevier Academic Press

ISBN-10: 0120885913 | ISBN-13: 978-0120885916

**OR** if you can obtain a used copy of this out-of-print text, you may use it **instead** of the above text: De Forest, P.R., Gaensslen, R.E., & Lee, H.C. (1983). *Forensic Science: An Introduction to Criminalistics*. New York: McGraw-Hill Book Company

ISBN-10: 0070162670 | ISBN-13: 978-0070162679

Supplemental handouts available on the course's Blackboard site.

### **Course Requirements**

Prerequisites: ENG 102 or ENG 201, CHE 201 & CHE 202 or equivalent. You must have taken and passed all of the prerequisites in order to take this course.

Attendance is required. More than two (2) absences will result in your final grade being dropped one level (e.g. B to B-) for each absence after the limit. Lateness of more than five (5) minutes will be counted as an absence. It is unacceptable to schedule personal appointments during class time. Unless there are legitimate circumstances, all absences will be counted as unexcused. Excused absences must be accompanied by written documentation. Attendance will be recorded on a roll sheet which will be signed during each class. Students are responsible for signing the roll sheet and will be considered absent if they forget to do so.

Students are responsible for all readings, whether they are from the book or from handouts distributed by the instructor. Any and all information from the readings will be considered acceptable material for the exams.

Test material will be drawn from the instructor's lectures, the course textbook, from handouts provided by the instructor and from laboratory work.

During examinations, students may not use any extraneous reference materials (e.g. books, notes, papers), communicate with other students, or use electronic devices such as phones, pagers, or PDA's. Any student caught cheating will receive a zero for the exam, be referred to the College's Academic Integrity Officer for further action and recommended for dismissal from the Forensic Science Program. As a student of

forensic science, you are expected to act with integrity. **No make-up exams will be given.**

There will be one major paper to be written for this class. Requirements, as well as APA guidelines for this paper are outlined on the last pages of this course syllabus. In addition to submitting a hardcopy of the paper, students will submit a digital copy to *turnitin.com*, a website service supported by the College, which compares submitted papers against websites, references, and other papers previously submitted. Term papers with inadequate documentation of sources will receive a zero. Papers proven to be plagiarized will receive a zero. In such a case, the student will be referred to the College's Academic Integrity Officer and recommended for dismissal from the Forensic Science Program. Self-plagiarism, which involves submitting the same work to different course professors, will also be penalized. Ignorance is not an excuse for plagiarism. For clarification on the nuances of plagiarism, students should review *The Perils of Plagiarism* by Francis X. Sheehan.

*Statement of College Policy on Plagiarism:*

Plagiarism is the presentation of someone else's ideas, words, or artistic, scientific, or technical work as one's own creation. Using the ideas or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism. It is the student's responsibility to recognize the difference between statements that are common knowledge (which do not require documentation) and restatements of the ideas of others. Paraphrase, summary, and direct quotation are acceptable forms of restatement, as long as the source is cited. Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has free guides designed to help students with problems of documentation (*John Jay College of Criminal Justice Undergraduate Bulletin*, <http://www.jjay.cuny.edu/academics/654.php>, see Chapter IV Academic Standards).

Students will read and sign two copies of *The Perils of Plagiarism*; one will be returned to the instructor, while the other will be taped to the inside front cover of the lab notebook.

**Course Information**

Your grade will be determined as follows:

Midterm Exam	150 pts
Final Exam	200 pts
Research Paper	125 pts (Peer Editing Assignment is incorporated)
Lab Notebook	135 pts (total of all of the laboratory exercises)
Homework Questions	90 pts

Grades will be assigned based on the percentage of points achieved. See the John Jay College Undergraduate Bulletin for the College's assignment of grades based on percentages.

Your laboratory notebook grade will be determined by your thoroughness and, where applicable, correct identification of an unknown. Points will be deducted for incorrect documentation and poor laboratory procedure.

### **Laboratory Exercises**

Microscopy Basics (no unknown)	20 pts
Hair Analysis (unknown)	25 pts
Bloodstain Pattern Analysis (no unknown)	20 pts
Fingerprint Development (no unknown)	20 pts
Footwear Imprints/Impressions (unknown)	25 pts
Gunshot Residue (unknown)	25 pts

Each lab will be followed by post-lab questions that are due at the beginning of the following class session. Post-lab questions turned in after that time will not be accepted. Each set of questions is worth 15 points. **This homework MUST be submitted by e-mail to the instructor. Paper copies will not be accepted.** The post-lab questions are designed to promote critical thinking regarding the techniques and about each area of criminalistics being studied. Students will be expected to use outside sources to answer some of the questions in each exercise. Only legitimate internet sources will be accepted (consult the library's handouts or the instructor if there is a question about a specific site), in addition to scholarly journals and books. Students are expected to provide the citations of references used, if any, for the questions.

SPRING 2013 FOS 313 COURSE SCHEDULE (tentative and subject to change)					
#	Date	Activity	Lecture Topic/Lab/Exam Schedule	Reading Assignment (Fisher Text)	Reading Assignment (De Forest Text)
1		Lecture	Course Outline, Safety Rules, Procedures and Notebook Guidelines; Discussion of Papers; Scientific Thinking and Writing; Introduction to Forensic Science	Chapter 1 & Appendix A	Chapter 1 & Appendix 1
2		Lecture	Recognition and Documentation of Physical Evidence; Crime Scene Procedures	Chapter 1 & Appendix C	Chapter 2 & Appendix 2
3		Lecture	Microscopy and Trace Evidence	Microscopy supplements	Chapter 3
		Lab # 1	Introduction to Microscopy		
			<b>NO CLASS: JJC MONDAY SCHEDULE</b>		
4		Lecture	Hair and Fiber Evidence, Part 1	Chapter 7	Chapter 8
		Lab # 2	Hair - Racial, Somatic and Species Identification, Part 1		
5		Lecture	Hair and Fiber Evidence, Part 2	Chapter 7	Chapter 8
		Lab # 2	Hair - Racial, Somatic and Species Identification, Part 2		
		Due	Lab Notebooks & Microscopy Lab # 1 Questions		
		Due	Term Paper Journal Article Selection		
6		Lecture	Glass & Soil Evidence	Chapter 6	Chapter 7
		Lecture	Physical Pattern Analysis	Chapter 2	Chapter 11
		Due	Lab Notebooks & Hair Lab # 2 Questions		
7		Lecture	Fingerprints/Individualizing Patterns, Part 1	Chapter 4	Chapter 12
		Lab # 3	Bloodstain Pattern Analysis		
8		EXAM	MIDTERM		
9		Lecture	Fingerprints/Individualizing Patterns, Part 2	Chapter 4	Chapter 12
		Lab # 4	Development of Latent Fingerprints		
		Due	Lab Notebooks & Bloodstain Lab # 3 Questions		
			<b>SPRING BREAK</b>		
10		Lecture	Footwear and Tire Impressions	Chapter 2	Chapter 11
		Lecture	Firearms and Toolmarks	Chapters 2 & 3	Chapter 14
		Due	Lab Notebooks & Fingerprint Lab # 4 Questions		
11		Lab # 5	Footwear Imprints and Impression		
		Due	Term Paper Deadline #1		
12		Lecture	Fires and Explosions	Chapter 9	Chapter 4
		Lab # 5	Footwear and Tire Impressions (continued)		
		Due	Term Paper Deadline #2		
13		Lab # 6	Gunshot Residue (GSR) Detection and Range Determination		
		Due	Lab Notebooks & Footwear Evidence Lab # 5 Questions		
14		Lecture	Guest Lecturer: Forensic Odontology		
		Lecture	Scientific Photography	Blackboard	Appendix 3
		Due	Lab Notebooks & GSR Lab #6 Questions		
15		EXAM	FINAL EXAM (1230-1430hrs)		

## **College Wide Policies for Undergraduate Courses**

(see the *John Jay College of Criminal Justice Undergraduate Bulletin*, <http://www.jjay.cuny.edu/academics/654.php>, see Chapter IV Academic Standards).

- The college's Grade of Incomplete (INC) policy and Extra Work During the Semester policy, as detailed in the undergraduate bulletin, will be followed for this course.
- Americans with Disabilities Act (ADA) Policies: Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the Office of Accessibility Services (OAS). Prior to granting disability accommodations in this course, the instructor must receive written verification of a student's eligibility from the OAS. It is the student's responsibility to initiate contact with the office and to follow the established procedures for having the accommodation notice sent to the instructor.

## **Laboratory Guidelines**

1. Read and understand the safety rules. Sign and date two copies – one is to be returned to the instructor and the other is to be taped into the inside back cover of your lab notebook. You are required to adhere to all safety rules while in the laboratory (this includes the lecture portion of this course because of its laboratory setting). Failure to comply with the safety rules will result in immediate expulsion from the laboratory and a grade penalty.
2. Your laboratory notebook must be a 9<sup>3</sup>/<sub>4</sub>" x 7<sup>1</sup>/<sub>2</sub>" marbled composition notebook of 100-150 sheets with sewn binding. See the notebook guidelines that follow for rules regarding documentation of lab experiments in this notebook. You CANNOT use this notebook for lecture notes, etc. It is solely for laboratory work.
3. You must bring your laboratory notebook on all days that lab is scheduled. If you do not bring your notebook, you will not be able to do your lab. There are no make-up lab times.
4. You must be signed into your notebook by the instructor prior to beginning ANY lab work. All lab work, including observations, calculations and procedures, must be documented directly into your notebook. No notes are to be made on separate paper. Lab work must be documented thoroughly and consecutively. Making mistakes is acceptable and expected; trying to cover up these mistakes is inexcusable. At the end of the lab time or class period, you must be signed out in your notebook before leaving the classroom. You MAY NOT insert additional information after being signed out of lab.
5. You MUST clean up after yourself while in the laboratory. Wipe down the bench tops and clean any dirty glassware that you used; dispose of paper waste in the regular trashcans and glass waste in the white broken glass bins. Failure to leave the lab

clean and tidy will result in a grade deduction for responsible parties or for the entire class.

6. In the event of an emergency, use the nearest phone to contact security, x8888.

## TABLE OF CONTENTS

#	Exercise	Page Range	Grade
1	Introduction to Microscopy		
2	Hair - Racial, Somatic and Species Identification		
3	Bloodstain Pattern Analysis		
4	Development of Latent Fingerprints		
5	Footwear Imprints and Impression		
6	Gunshot Residue Detection and Range Determination		

### Lab Notebook Guidelines

1. Your notebook must be a bound composition book, 100 or 150 sheets. Before you begin any lab work, all of the pages must be properly numbered. Number each page in the uppermost outer corner, starting with the first page.
2. The front cover should have the following information clearly printed on it:  
Your Name, FOS 313, SPRING 2012
3. Only non-water soluble blue or black ink is acceptable for writing in your notebook.
4. The first page is to be reserved for the Table of Contents. This should include the title of the lab and the starting and ending pages of each. The instructor will demonstrate the correct taping procedure for the Table of Contents page.
5. When skipping a page in the notebook, "Intentionally Left Blank" should be written on a line about halfway down the page. A diagonal line should be drawn across the page from the upper left to the lower right corner, without passing through the space containing the words above. Initial and date both the top and the bottom halves of the line. The same line-out procedure should be used for "Reserved for..." pages where you will be taping items on the page.
6. When taping an item on a page of your notebook, place the item's edge near one of the margins and tape the LEFT edge of the item to the paper. Flip the paper over and place another piece of tape in the same position on the underside of the paper. The item should ONLY be taped on the left side, on both the top and the underside. The purpose of this is two-fold: the item is securely attached to the book so there is no concern of it falling out at a later time, and the item does not cover any portion of

the notebook page (it is easily shown that there is no writing underneath, aside from the "Reserved for..." notation).

7. All dates should be written in the following format: dd-mmm-yyyy (e.g. 06-MAR - 2012). This avoids ambiguities. The date must be written in the left margin of each page. Be sure to use a leading zero for the first nine days of the month (01, 02, etc.).
8. All times must be written in military format (i.e., 1415hrs instead of 2:15pm).
9. MARGIN USE: The left, top and bottom margins in the notebook are to be left blank with the following EXCEPTIONS: ONLY the date can be written in the left margin; the top margin is reserved for the title of the lab exercise (only necessary for the first page of that exercise) and to document the date (top left margin) and the time continued when continuing the lab on the next page. The page number must be written in the uppermost and outermost corner of the page in the area of the top margin.
10. All new exercises should begin on an odd-numbered page.
11. When beginning an exercise, the title of the lab should be written on the first line, along with the date in the left margin. Draw a line through the next line, just below the title. Then sign into the lab and have the instructor sign you in.
12. When documenting your observations, use every line on the page without skipping lines or leaving spaces. All writing must be legible; if it is not, the lab will not be graded and you will receive a zero for the lab.
13. Contiguous documentation is required. Do not summarize work or go back and add information to previous documentation. Do not document an action before you perform that action. All documentation should be in either present tense or past tense.
14. If you do not write to the end of the line, simply line out the remainder of the line and continue on to the next line.
15. Sketches cannot have writing to the left or right of them on the page (including other sketches). Any empty space must be lined out (either diagonally or straight across each line). All sketches must have an indication above or below that they are either *to scale* or *not to scale*, in addition to what magnification they are being viewed at through the microscope (total magnification).
16. If you make an error while writing, draw a single line through your error, initial and date the line (immediately to the right of the lined out error), and write the correction immediately following. Do not obliterate mistakes by scribbling over them or overwriting the correct answer on the mistake. For mistake corrections after additional documentation initial and date directly above the lined out error, asterisk the error and note the page where the correction can be found. This correction should be documented as "\*Correction from page #..."). Use additional asterisks when more than one error correction is noted on a single page.



18. When receiving an unknown, you must document who handed you the unknown, when and where you received it, the unknown number and any markings. Immediately write "received" and add your initials and date to the package in which the unknown was received. Fill out a chain of custody form. Then describe the unknown envelope/package including its dimensions. A sketch of the unknown package, front and back, including all markings on the package, should be made in your notebook. When opening your unknown, you must make a new opening without disturbing the original seal. You must write "opened" and date and initial near the new opening.
19. The unknown must be returned to the instructor at the end of the lab unless instructed otherwise. Before returning the unknown, you must return the unknown to its original package, seal the package, then initial and date across the seal; mark the package "sealed". You must document this transfer back to the instructor in the same manner in which it was received (who, what, how, when, where, chain of custody form).
20. At the end of any lab with an unknown, a report in the following format must be made: "Report: Unknown # \_\_\_\_ (is consistent with / is / contains) \_\_\_\_\_". This report is to be made on a new page and **followed by your full signature and the date**. There is no need to sign out after reporting your unknown, as the report serves to indicate that you are done with the lab.
21. Documentation is critical, especially when dealing with the unknown. Your documentation should be unambiguous and demonstrate that the integrity of your unknown has not been compromised. Never leave your unknown unattended.

Adapted from Advanced Criminalistics I (FOS 415/710) Lab Manual, 2006.

## Point Value System for Notebook Grades

The lab exercises will be graded as a factor for the points assigned to each exercise. The maximum factor for an exercise is 1.0 (equal to 100% of points). The penalties below will be deducted from the maximum factor of 1.0. Penalties may be assigned multiple times for multiple infractions, at the discretion of the instructor.

<u>Point Penalty</u>	<u>Notebook Infraction</u>
-0.50	Incorrect or nonspecific reporting of an unknown, including insufficient or liberal reporting beyond the capabilities of the technique
-0.10	Safety rules or perils of plagiarism not taped into book
-0.10	No report page for exercises which have an unknown analysis to be reported.
-0.10	Pages in notebook not numbered
-0.05	Did not master technique
-0.05	Did not sign in or out
-0.05	Incontiguous documentation
-0.05	Backdating (corrections, information, etc.)
-0.04	Did not individualize the unknown by initialing, dating (where possible), description & sketching
-0.04	Did not perform a portion of the exercise or did not do portion correctly
-0.02	Did not mark evidence "received", "opened" or "sealed" when working with unknown
-0.02	Improper use of margins (writing in area to be left blank)
-0.02	Overwriting or obliterating information
-0.02	Improper mistake correction procedure
-0.02	Summarizing data
-0.02	Inserting data
-0.02	Sketch did not include scale or indication that it was not drawn to scale
-0.02	Erroneous information (e.g. 10x vs. 100x mag)
-0.01	Table of Contents not kept up-to-date
-0.01	Improper taping procedure
-0.01	Did not properly line out blank portion of line or page, including failure to initial and date line

Adapted from Advanced Criminalistics I (FOS 415/710) Lab Manual, 2006.

## FOS 313 Term Paper: Journal Article Review

This paper is to be a review and critique of a recent (within the last 5 years) scientific article from a forensic science journal. You should start by examining several recent issues of the following:

Journal of Forensic Sciences  
Forensic Science International  
Science and Justice  
American Journal of Forensic Medicine and Pathology

Other articles from a science periodical may be acceptable if the focus of the paper is forensic in nature. The Lloyd Sealy Library has an excellent selection of appropriate journals available onsite and many journals are available through the library online.

Students must submit the journal article citation in APA format (author/s, year, title, journal, volume, and pages) and the abstract for the article to the instructor. Students can begin submitting their paper topic to the instructor via e-mail after the first day of class; if possible, submit an electronic version of the article as an attachment to the e-mail message. Approved journal articles will be posted by the instructor on the Blackboard site for this course. No duplicate articles within the class will be allowed; articles are first come, first serve. Students are responsible for checking the list for their articles before submitting their article selection. Journal articles must be chosen by the date specified on the syllabus to be turned in to the instructor. The instructor reserves the right to have a student change his/her journal article up to five weeks before the due date.

You may wish to browse more than one article and narrow down from there before submitting your final choice. Look for an article which deals with an area of forensics that holds some interest for you. The article should be technical in nature in that the authors researched a particular area to clarify a phenomenon and have presented their experimental methods, results and conclusions.

Your task is to review and critique the article. The review is simply a summary of the article. Critiquing the article will be a more challenging task. To do this, you will need to examine other reference materials (for instance your textbook and other articles referenced in the article). You need to have a basic understanding of the forensic field discussed in the article in order to critique it. Some questions that you should answer in the body of your paper:

Did the authors have a comprehensive experimental design?  
Did their experiments adequately address the issue at hand?  
Do you agree with the authors' conclusions?  
Can you think of anything that the authors should have done that they didn't do?  
Can you think of any way the authors could have done a better job?  
How has their research improved forensic science?  
Do their results lead to other possible research projects?

Term paper guidelines:

- ◆ Check the syllabus for due dates including due date for article selection, paper draft and final paper submission.
- ◆ 3 to 5 pages in length
- ◆ Word-processed using 12 pt Times New Roman font
- ◆ Double-spaced with one inch margins all around.
- ◆ APA style references (see library website, <http://www.lib.jjay.cuny.edu/research/>).
- ◆ Cover page which includes the article citation, your name, FOS 313, the date and my name
- ◆ You must include a copy of the article which you reviewed (submit either a hard copy of the article or e-mail me a pdf digital file of the article) with the hardcopy of the paper that you submit!

The term papers will be peer reviewed prior to final submission to the instructor and to Turnitin. Papers must be submitted to the instructor by the first deadline. Students will be given a copy of one of their classmate's papers to review. They will be required to provide feedback on that paper with regard to content (Did the paper fulfill all the requirements specified herein?) as well as feedback on spelling, grammar and appropriate referencing. Students will have one week to return the edited paper to the term paper author with the peer feedback. Student authors will then have one more week to incorporate the feedback to improve their term paper. Only the final version of the paper will be submitted to the instructor for grading and to Turnitin.com by the second deadline.

Students must submit both a hardcopy version and a digital version of their paper. Failure to turn in the paper on time will result in a 10 point penalty for each day late. The digital version of the paper must be submitted via the Turnitin website accessible through <http://www.turnitin.com/>. Missing the Turnitin deadline will also result in a 10% penalty. Enroll using the New User link on the upper right hand corner.

Turnitin for Spring 2012

FOS 313 S12

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