



Sam Houston State University

A Member of The Texas State University System

COLLEGE OF CRIMINAL JUSTICE

DEPARTMENT OF FORENSIC SCIENCE

FORS 6094

Trace Evidence and Microscopical Analysis

Spring 2018

Professor: Patrick Buzzini, PhD

Telephone: 936-294-3633

Class hours: Lectures Tues & Thurs 3:00 pm - 4:20 pm

Lab Group 1 Fri 9:00 am -12:50 pm

Lab Group 2 Fri 1:00 pm – 4:50 pm

Office Hours: Tues & Thurs 10:00 am-12:00 pm.

Office: 221G

e-mail: patrick.buzzini@shsu.edu

Classroom: CFS 104 and CFS 219

Textbooks

Kubic T, Petraco N. Color Atlas and Manual of Microscopy for Criminalists, Chemists, and Conservators. CRC Press Boca Raton, FL (2003). Available online at: http://www.crcnetbase.com/page/forensic_ebooks.

Course description

This course covers the most commonly encountered types of material clues submitted for examination to a trace evidence section of a forensic laboratory: this includes the characterization and examination of hairs, fibers, paint, glass, and more. The review of the different methods of search and collection of trace evidence as well as the aspects related to their analysis and interpretation will be discussed and applied. Major instrumentations covered in this course are stereomicroscopy, polarized light microscopy (PLM), comparison microscopy, Fourier transform infrared (FTIR) spectroscopy, microspectrophotometry and Raman spectroscopy. This course includes a strong laboratory component.

Course objectives

The goal of this course is to provide you with basic knowledge and skills to understand and perform examinations of the most commonly encountered types of trace evidence.

After successful completion of this course you will:

1. Acquire advanced knowledge and develop key skills, which may be useful for successfully working in a typical trace evidence unit of a forensic laboratory.
2. Be highly knowledgeable with the types of trace evidence mainly encountered in forensic laboratory casework;
3. Learn the proper methodologies of proper collection, analysis and interpretation of trace evidence.
4. Practice the advanced examination of several materials using microscopical and instrumental analytical methods.

Course Schedule

Week	Date	Topic	Activity
1	Thu Jan 18	Introduction to trace evidence	L
	Fri Jan 19	<i>No lab</i>	
2	Tue Jan 23	<i>No class - IPTES conference</i>	RA: Petraco & Kupic (2004) Hopen (2009)
	Thu Jan 25	<i>No class - IPTES conference</i>	
	Fri Jan 26	<i>No class - IPTES conference</i>	
3	Tue Jan 30	Light microscopy	L
	Thu Feb 1	Light microscopy	L
	Fri Feb 2	Lab for everyone (8:00 – 12:00) – Room 219 Micromanipulations, particle sorting and isolation, and microscopy slide preparations	D+E
4	Tue Feb 6	Light microscopy	L
	Thu Feb 8	Light microscopy	L
	Fri Feb 9	Lab: light microscopy	D
5	Tue Feb 13	Animal and Human Hair	L
	Thu Feb 15	Animal and Human Hair	L
	Fri Feb 16	Lab: Microscopy, cross-sections and scale casts	Exercise 1 - Distribution
6	Tue Feb 20	<i>No class – AAFS meeting</i>	
	Thu Feb 22	<i>No class – AAFS meeting</i>	
	Fri Feb 23	<i>No class – AAFS meeting</i>	
7	Tue Feb 27	Textile Fibers	L
	Thu Mar 1	Textile Fibers	L
	Fri Mar 2	Laboratory – Polarized microscopy	L+D
8	Tue Mar 6	Written Test 1	
	Thu Mar 8	Color and microspectrophotometry	L
	Fri Mar 9	Laboratory – Microspectrophotometry	D+E Exercise 1 – Due Date
9	Tue Mar 13	<i>No class - Spring break</i>	
	Thu Mar 15	<i>No class - Spring break</i>	
	Fri Mar 16	<i>No class - Spring break</i>	
10	Tue Mar 20	Paint evidence	L Exercise 2 - Distribution

	Thu Mar 22	Paint evidence	L
	Fri Mar 23	Laboratory – FTIR spectroscopy	D+E
11	Tue Mar 27	Vibrational spectroscopy	L
	Thu Mar 29	Interpretation of IR spectra of paint	L+E
	Fri Mar 30	<i>No Class – Good Friday</i>	
12	Tue Apr 3	Glass examination	L
	Thu Apr 5	Fire debris analysis	L
	Fri Apr 6	Laboratory – Mock casework	E
13	Tue Apr 10	Footwear evidence	L
	Thu Apr 12	Footwear evidence interpretation	L
	Fri Apr 13	Laboratory – Footwear evidence	E
14	Tue Apr 17	Trace evidence interpretation	L
	Thu Apr 19	Trace evidence interpretation	L
	Fri Apr 20	Laboratory – Mock casework	E
15	Tue Apr 24	Trace evidence interpretation	L
	Thu Apr 26	Trace evidence interpretation	L
	Fri Apr 27	Laboratory – Mock casework	E
16	Tue May 1	Trace evidence interpretation	L
	Thu May 3	Trace evidence interpretation	L
	Fri May 4	Exercise 2 individual oral presentations	
17	Tue May 8	Written test 2 (3:30 pm – 5:30 pm)	

L: lecture; D: Lab demo; E: exercise; RA: Reading assignment.

Schedule may be subject to modification

Attendance policy

Attendance will be recorded in keeping with University policy. Students are expected to attend class. Class attendance requirements will be followed in accordance with Academic Policy Statement 800401. In accordance with university policy, students will not be penalized for absences of up to three hours as long as assigned work has not been missed. If a student is absent it is their responsibility to obtain the class material and remain current with information distributed during class. Occasionally changes in schedule may be announced in class. *These changes apply to all students, even those who were absent from class.* One letter grade may, at the discretion of the instructor, be deducted from students' final grade if they miss more than four classes. There will be no distinctions between "excused" and "unexcused" absences. Students are expected to be on time to class. After the beginning of the class, late students may be counted as absent.

Grading Policy

Final grades will be based upon the following scale: 90 plus average an "A"; 80 to 89 a "B"; 70 to 79 a "C". Appeals will be handled in accordance with University Policy Statement 900823, Academic Grievance Procedures for Students.

Assessment

Your performance will be evaluated through two practical exercises and two written tests. The first practical project consists of a mock casework involving the identification of animal hair. The second practical project

consists of a practicum, meaning a mock case involving the characterization and comparison of various trace evidence. The first written test will be on the first part of the material covered during the semester, while the second test will be on the remainder of the semester.

The grades are weighted as follows:

- | | |
|---|-----|
| 1. Exercise 1 – Identification of animal hair | 25% |
| 2. Exercise 2 – Practicum on mock casework | 25% |
| 3. Written test 1 | 25% |
| 4. Written test 2 | 25% |

Materials for written exams may come from class materials, supplemental reading materials, class discussions or lab demonstrations that are not necessarily explicitly written in the course handouts. Furthermore, special instructions and guidance on exam material may be disseminated during class time. *As a corollary, attendance and active participation in class are extremely important components to successfully complete the course.*

Make-up exams

There will be only one opportunity for make-up written exams. Such opportunity will be offered within a week of the date of the missed test. This opportunity will be given only in the event of a documented university-sponsored activity, or other unforeseen and unavoidable event. A written justification is required for such consideration. Missing this opportunity results in a grade of zero.

Student academic policies

Policies concerning Attendance, Academic Honesty, Disabled Student and Services for Disabled Students, and Absences on Religious Holy days may be found at: <http://www.shsu.edu/dept/academic-affairs/aps/aps-students.html>

Use of Cell & Smart Phones, PDA's & Similar Devices

Engaging in voice communication using a cell phone or similar communication device during class is prohibited. Device sound alerts should be turned off during class. Engaging in text communication during class is discouraged, although non-disruptive occasional use is permitted. Persistent or extended texting is, however, not allowed. Per University policy communication using any electronic device during an in-class examination is prohibited.

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