Justice Studies Department
San Jose State University
Spring 2005
Class hours W 1730-2015
Room: MH 520

Instructor: Dr. Steven Lee
Office Hrs: M 1315-1815
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JS 113
Introduction to Forensic Sciences

Course Description:

This course is designed to introduce students to the basics of forensic science. Students will be introduced to the scientific concepts, methods, practices and analytical instrumentation utilized by forensic scientists for the recognition, collection, preservation, identification, comparison, analysis and documentation of physical evidence. Evidence interpretation and court testimony, professional requirements, standards, training, ethics, and quality assurance will also be covered.

Course Text and materials:

Required Text:

Criminalistics: An Introduction to Forensic Science (College Version), ***8/E*, Copyright 2004, published 6-18-2003,** RE. Saferstein, Ph.D., ISBN: 0-13-111852-8, Prentice Hall, 608 pp. http://vig.prenhall.com/catalog/academic/product/0,4096,0131118528,00.html

Required reading and internet materials:

Journal articles and other readings will be accessible at the SJSU library, on reserve or will be accessible on line. Citations and URLs for on line materials will be provided in assignments. CA Dept of Justice Physical Evidence Bulletins: http://www.cci.ca.gov/Reference/peb/peb.html and other forensic science web sites will be required reading.

Supplementary Texts (Optional)- Course material may include citations from the following:

Forensic Science Handbook Volume III, 1/e Richard Saferstein ***©1993 / ISBN:*** *0133253902*
Forensic Science Handbook, Volume II, 1/e Richard Saferstein, Bill Bliss, Arlington, VA ©1988 / ISBN: 0133268772
Techniques of Crime Scene Investigation, 2003. Seventh Edition. Barry A. J. Fisher. ISBN: 084931691X. CRC Press LLC. 544 pp.
Forensic Science: An Introduction to Scientific and Investigative Techniques. ***2003****. Stuart H. James and Jon J. Nordby eds., ISBN: 0849312469, 698pp. CRC Press*
Henry Lee's Crime Scene Handbook. **2001**. Henry Lee. PhD. ISBN 0-12-440830-3, 418pp. Academic Press.
Forensic DNA Typing: Biology and Technology Behind STR Markers **2001**. John Butler PhD. ISBN: 0-12-147951-X 322 pp. Academic Press
Forensic Firearms Evidence" handbook. 1995. Lucian Haag. Workbook.
*Experiments and Practical Exercises in Bloodstain Pattern Analysis.***1998.** Laber, T and Epstein B. 1998 5th printing. Minnesota BCA.

Course Format:

The course will include **lectures by the instructor, assistants and guest lectures** from crime laboratory forensic scientists. **Discussions, videos, small-group hands-on activities, and laboratories** will also be included throughout the semester. If possible, on-line chats and field trips (to at least one crime laboratory) will be scheduled (TBA).

Course requirements:

Exams: Three exams will be given in this course. Exams will be cumulative and will include all material covered up to the date of the exam. Exams may include multiple choice, matching, true/false, short answer, diagrams, drawings and sketches, short essay and/or long essay.

Exam 1: Weds Mar 2 Exam 2: Weds Apr 6 Final: R- May 19 1445-1700

Quizzes

Quizzes on assigned readings, laboratories, small group activities and other assigned materials will be given during the semester. These will generally be multiple choice, matching, true/false and short answer but may also include essay questions.

Laboratory Reports with 5 take home report questions on each report

Three laboratory reports will be required. Each will be worth 50 points. The format and grading of the laboratory reports will be provided at the first laboratory session.

Labs- 2/16 - Fingerprints
3/09 - *Organic Analysis- TLC*
3/23 - Impressions Evidence
4/20 - Biological Analysis- Pt 1. Serology
4/27 - Biological Analysis- Pt 2. DNA
05/4 - Biological Analysis- Pt 3. PCR/STRs/CE

Grading

Quizzes	50 points
Exam 1	100 points
Exam 2	100 points
Final exam	100 points
Lab reports	150 points
Total required	500 points

A total of 10 points may be granted for small group assignments and other assignments during the semester. Each assignment will be worth 1-2 points each. These extra credit points may be used to augment your final point total.

Grading Policies

Make-up exams will not generally be permitted. However, under extraordinary circumstances, with proper documentation and approval by the instructor, a 15 page single-spaced term paper of an instructor assigned topic, may substitute for 1 exam.

	From	To
A+	483.5	500
A	467	483.4
A-	450	466.9
B+	433.5	449.9
B	417	433.4
B-	400	416.9

C+	383.5	399.9
C	367	383.4
C-	350	366.9
D+	333.5	349.9
D+	317	333.4
D-	300	316.9
F	<300	

Instructor

Professor Lee holds an MS from NYU and PhD from University of California, Berkeley in Molecular Biology. Lee holds several concurrent positions including a consulting position as Director of R&D at MiraiBio Inc. a small biotech company in Alameda, CA, Visiting Scholar at UC Berkeley, and holds adjunct professor appointments in Biological Sciences at San Francisco

State University and Chemistry at Florida International University. He was formerly the Director of R&D at CA Dept of Justice DNA Laboratory from 1994-2000 where he served as an expert witness in DNA and conducted DNA training courses. He is a full member of the American Association for the Advancement of Science, American Academy of Forensic Sciences, the California Association of Criminalists and is an American Society of Crime Laboratory Directors Laboratory Accreditation Board certified inspector. He also served on the FBI Technical Working Group on DNA Analysis Methods group from 1994-2000. He has taught courses in molecular biology at SFSU (1996-1998), Forensic genetics at UC Davis (1997), and most recently forensic DNA Typing of STRs at FIU (2003).

Tentative Course Schedule:

Dates	Topics	Saferstein
Week 1:	**Introduction and Overview of Forensic Science**	**Chap 1 (C1)**
1/26	Handouts-Syllabus- Reading material Introductions: Your background, TA backgrounds, my background Course Description, requirements, grading etc. Set up small student groups ***Assignment- Sign in- send an email to: Steven.Lee@sjsu.edu*** ***Read Saferstein Chapter 1 and 2*** **Introduction to Criminalistics** Definition and Scope of Forensic Science. History and Development of Forensic Science. The Organization of a Crime Laboratory. Services of the Crime Laboratory. The Functions of the Forensic Scientist. Forensic Science Services	
2/2:	**The Crime Scene- and Physical Evidence**	**C2 and 3**
	Processing the Crime Scene. Legal Considerations **Overview of Criminalistics**	**C2**
	Physical Evidence Common Types of Physical Evidence. The Significance of Physical Evidence.	**C3**
2/9:	**The Microscope – Light, compound, comparison, IR, SEM**	**C7, C4**
	Initial Examination- Characterization and Identification The Compound Microscope. The Comparison Microscope. The Stereoscopic Microscope. The Polarizing Microscope. The Microspectrophotometer. The Scanning Electron Microscope (SEM).	**C7**
	Glass and Soil The Metric System. Physical Properties. Comparing Glass Fragments. Glass Fractures. Collection and Preservation of Glass Evidence. Forensic Characteristics of Soil. Collection and Preservation of Soil Evidence.	**C4**
2/16	**Laboratory 1 A Fingerprints and Intro to Physical Evidence**	**C14**
	Laboratory 1A- Fingerprints **Handouts &** History of Fingerprinting. Fundamental Principles of Fingerprints. Classificatio of Fingerprints. Automated Fingerprint Identification Systems. Methods of Detecting Fingerprints. Preservation of Developed Prints. Digital Imaging for Fingerprint Enhancement.	**C14**
2/23	**FBI Laboratory Video and Group Assignments-Student led reviews**	
	Chapters 1, 2, 3, 4, 7 and 14 **Video- The latest in crime fighting from the FBI** **Lee will be at the American Academy of Forensic Science meeting**	

03/02 **Exam 1**

Chapters 1, 2, 3, 4, 7 and 14

03/09 **Chemical Foundations: Organic and Inorganic Analysis** **C5**

Chemical Foundations: Organic Analysis Elements and Compounds.Selecting Analytical Technique. Chromatography. Spectrometry. Mass Spectrometry (MS).

Chemical Foundations: Inorganic Analyses **C6**

Evidence in the Assassination of President Kennedy.
The Emission Spectrum of Elements. Atomic Absorption Spec.
The Origin of Emission and Absorption Spectra.
Neutron Activation Analysis. X-Ray Diffraction

03/16 **Drugs and Forensic Toxicology** **C9, C10**

Drug Dependence. Narcotic Drugs. Hallucinogens. Depressants. Stimulants. Club Drugs. Anabolic Steroids. Drug-Control Laws. Drug Identification. Collection and Preservation of Drug Evidence.

Toxicology of Alcohol. The Role of the Toxicologist. Techniques Used in Toxicology. The Significance of Toxicological Findings. The Drug RecogExpert.

03/23 **Laboratory 2 Impression Evidence and Student led reviews** **C15**

Impression Evidence Lecture/Lab

Bullet Comparisons. Cartridge Cases. Automated Firearm Search Systems. Gunpowder Residues. Primer Residues on the Hands. Serial Number Restoration. Collection and Preservation of Firearm Evidence. Tool Marks. Other Impressions.

Student led reviews- C5,6, 9, 10, 15

03/30 **Spring Break- No Class**

04/06 **Exam 2- C5,6, 9, 10, 15**

04/13 **Trace: Hairs, Fibers, and Paint- Arson/Explosives, Q D** **C8, 11, 16**

Morphology, Identification & Comparison of Hair. Types of Fibers. **C8**
Identification and Comparison of Man-Made Fibers. Forensic Examination of Paint. Collection and Preservation of trace evidence.

Arson and Explosion **C11**

The Chemistry of Fire. Searching the Fire Scene. Collection and Preservation of Arson Evidence. Analysis of Flammable Residues. Types of Explosives. Collection and Analysis of Explosives.

Questioned Documents **C16**

Handwriting Comparisons. Collection of Handwriting Exemplars. Typewriting Comparisons. Photocopier, Printer, and Fax Examination. Alterations, Erasures, and Obliterations. Other Document Problems. Voice Examination.

04/20 **Biological Foundations- Laboratory 3A- Serology** **C12**

Biological Foundations- Intro to Serology **C12**

The Nature of Blood. Forensic Characterization of Bloodstains. Stain Patterns of Blood. Principles of Heredity. Forensic Characterization of Semen. Collection of Rape Evidence.

Laboratory 3A – Serology

04/27	**Biological Foundations-Introduction to DNA and Lab 3B**	**C13**
	Intro to Deoxyribonucleic Acid: Central Dogma- **DNA extraction**	**C13**
	Genetic Code, Chromosomes, Synthesis, Restriction Enzyme, quantification	
	Laboratory 3B- Forensic Biology Laboratory	**C12,C13**
	DNA Profiling (RFLP Analysis), **electrophoresis**, hybridization and fragment analysis, **PCR** and Short Tandem Repeats	
	Lab 3B- DNA extraction/electrophoresis	
05/04	**DNA continued and Lab 3C PCR**	**C13**
	STRs, Mitochondrial DNA, Y Chromosome testing,	**C13**
	Medical Benefits, Legal and Ethical Considerations	
	Innocence Project	
	Lab 3C - PCR	
05/11	**Computers and Forensics/Student led reviews**	**C17**
	Legal and Ethical Issues in Forensic Science, Court Testimony	
	Use of Computers in Forensic Science	**C17**
	Investigation of Computer-Related Crime	
	See Casey 2004- Digital Evidence and Computer Crime	
	The Future and Course Review	
	Countering Chaos: Logic, Ethics, and the Criminal Justice System	
	Considerations in evidence interpretation	
	Lessons from- Court Testimony	
	Course Review for final exam	
	Student Led Final Review	
	Student Led Reviews C8,11,12,13, 16 and 17	
Thursday	**05/19 1445-1700 Final Exam**	