

Justice Studies Department
San Jose State University
Fall 2004
Class hours MW 1200-1315
Room: MH 520

Instructor: Dr. Steven Lee
Office Hrs: M 1500-1800 T1100-1300
set by appointment via email
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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.prehall.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: Mon. 10/04/04 Exam 2: Mon. 11/08/04 Final: TBA

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- 09/08- Fingerprints

09/27- *Organic Analysis- TLC*

10/20- Impressions Evidence

11/08- Biological Analysis- Pt 1. Serology

11/17- Biological Analysis- Pt 2. DNA

12/1- 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
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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)
08/25	Handouts-Syllabus- Reading material Introductions: Your background, TA backgrounds, my background Course Description, requirements, grading etc. Set up small student groups <i>Assignment- Sign in- send an email to: Steven.Lee@sjsu.edu</i> <i>Read Saferstein Chapter 1 and 2</i> 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	
Week 2:	The Crime Scene- and Physical Evidence	C2 and 3
08/30	Processing the Crime Scene. Legal Considerations	C2
09/01	Overview of Criminalistics Physical Evidence Common Types of Physical Evidence. The Significance of Physical Evidence.	C3
Week 3:	Laboratory 1 A Fingerprints and Intro to Physical Evidence	C14
09/06	No Class- Holiday	
09/08	Laboratory 1A- Fingerprints History of Fingerprinting. Fundamental Principles of Fingerprints. Classification of Fingerprints. Automated Fingerprint Identification Systems. Methods of Detecting Fingerprints. Preservation of Developed Prints. Digital Imaging for Fingerprint Enhancement.	Handouts & C14
Week 4:	The Microscope – Light, compound, comparison, IR, SEM	C7, C4
09/13	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
09/15	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
Week 5:	Laboratory 1 B Fingerprints and Intro to Physical Evidence	C14
09/20	Laboratory 1B- Fingerprint laboratory- Comparisons	
09/22	Laboratory 1B cont. if nec. - and/or Organic Analysis	C5

Week 6:	Chemical Foundations-Organic Analysis	C5
09/27	Organic Analysis Elements and Compounds. Selecting an Analytical Technique. Chromatography. Spectrometry. Mass Spectrometry (MS). In class Laboratory TLC of Inks	C5
09/29	Review for Exam 1: C 1, 2, 3, 4, 7 and 14- Student led reviews	
Week 7:	Exam 1 and Video	
10/4	Exam 1: C1, 2, 3, 4, 7, and 14	
10/6	Video - Note: Lee will be at the International Human Identification Meeting	
Week 8:	Chemical Foundations: Inorganic Analyses	C6
10/11	Inorganic Analysis 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	C6
10/13	Drugs and Forensic Toxicology 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.	C9, C10
Week 9:	Laboratory 2 Impression Evidence	C15
10/18	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.	C15
10/20	Laboratory 2 Impression Evidence- Laboratory	Handouts
Week 10:	Trace evidence: Hairs, Fibers, and Paint- Arson and Explosion	C8, C11
10/25	Morphology, Identification & Comparison of Hair. Types of Fibers. Identification and Comparison of Man-Made Fibers. Forensic Examination of Paint. Collection and Preservation of trace evidence.	C8
10/27	Arson and Explosion 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.	C11
Week 11:	Biological Foundations- Laboratory 3A- Serology	
11/1	Biological Foundations- Intro to Serology The Nature of Blood. Forensic Characterization of Bloodstains. Stain Patterns of Blood. Principles of Heredity. Forensic Characterization of Semen. Collection of Rape Evidence.	C12
11/3	Laboratory 3A – Serology and Review for Exam 2	C5,6,8,9,10,11 15

Week 12	Biological Foundations-	C13
11/8	Exam 2	C5,6,8,9,10,11 15
11/10	Intro to Deoxyribonucleic Acid: Central Dogma- DNA extraction Genetic Code, Chromosomes, Synthesis, Restriction Enzyme, quantification	C13
Week 13	Laboratory 3B- Forensic Biology Laboratory	C12,C13
11/15	DNA Profiling (RFLP Analysis), hybridization and fragment analysis, PCR and Short Tandem Repeats	C13
11/17	Laboratory 3B-Forensic Biology lab- DNA	C12/C13
Week 14:	DNA continued and Questioned documents	C13, C16
11/22	STRs, Mitochondrial DNA, Y Chromosome testing, Medical Benefits, Legal and Ethical Considerations	C13
11/24	Questioned Documents Handwriting Comparisons. Collection of Handwriting Exemplars. Typewriting Comparisons. Photocopier, Printer, and Fax Examination. Alterations, Erasures, and Obliterations. Other Document Problems. Voice Examination.	C16
Week 15	Laboratory 3C Forensic Biology Lab and Computers	C13,C17
11/29	Use of Computers in Forensic Science Investigation of Computer-Related Crime See Casey 2004- Digital Evidence and Computer Crime	C17
12/1	Laboratory 3C Forensic Biology laboratory- PCR/STRs	
Week 16	Legal and Ethical Issues in Forensic Science, Court Testimony	C18
12/6	The future and Course Review	
12/8	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	
	Final Exam: TBA	