

The Real CSI (GE Area B1)¹
Metropolitan University Scholar's Experience (MUSE) Seminar
MUSE/JS 12B
Dr. Steven B. Lee

Class Basics

Room number: HGH 221 (MH 520-may move depending on availability)
Class Time: Mon. and Wed. 1200-1315

How to Contact your Professor

Instructor: Dr. Steven Lee
Office Hrs: Wed. 1445-1945- Please set by email appointment to avoid conflicts.
Room MacQuarrie Hall 521.
Email: steven.lee@sjsu.edu, slee@miraibio.com- Please use both emails.
Phone: 408-924-2948

How to Contact your Peer Mentor

Director Dr. Jill Steinberg
Office Royce Hall Lounge
355 S 8th Street
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Student Courtney Cook
408-924-5289
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Hours TBA

Introduction to MUSE²

The Metropolitan University Scholars' Experience (MUSE) is designed to help make your transition into college a success by helping you to develop the skills and attitude needed for the intellectual engagement and challenge of in-depth university-level study. Discovery, research, critical thinking, written work, attention to the rich cultural diversity of the campus, and active discussion will be key parts of this MUSE course. Enrollment in MUSE courses is limited to a small number of students because these courses are intended to be highly interactive and allow you to easily interact with your professor and fellow students. MUSE courses explore topics and issues from an interdisciplinary focus to show how interesting and important ideas can be viewed from different perspectives.

The Real CSI Course Description:

Develop your skills in the science of crime scene investigation through hands-on learning exercises. Basics of crime scene investigation and forensic science will be covered in this introductory course. Learn the appropriate methods for processing, securing, and isolating a crime scene. Topics include recording the scene, searching for evidence, decision-making about what evidence is appropriate and necessary to collect, procedures for collecting physical evidence, and maintaining the chain of custody to avoid contamination. Scientific concepts,

¹ Some formatting, text and content for this greensheet have been obtained with the author's permission from Geology 10B by Dr. June Oberdorfer (<http://www.geosun.sjsu.edu/~june/june/geol10B/index.htm>).

² Descriptions of MUSE were taken directly from the SJSU MUSE greensheet template in Area B1 (http://www.sjsu.edu/muse/docs/greensheet_b1.pdf).

methods, practices and analytical instrumentation utilized by forensic scientists for the recognition, collection, preservation, identification, comparison, analysis and documentation of physical evidence will also be covered. Hands-on activities will include: securing the scene, searching for physical evidence, documenting the scene, taking accurate measurements, and collection and interpretation of physical evidence such as fingerprints, blood spatter, shoeprints and DNA. Court testimony, professional requirements, standards, training, ethics, and quality assurance will also be covered. The interface of science and law will be discussed using case examples, current events, news, magazine and journal research articles.

Learning Objectives and Activities for this Course

This course qualifies as an Area B1 (Physical Sciences) course in your General Education requirements. It is designed to enable you to achieve the following learning outcomes. Examples of activities that meet these objectives are listed in the right hand column.

Student Learning Objective	Example(s) of activities to meet this objective
<ul style="list-style-type: none"> To use methods of science and knowledge derived from current scientific inquiry in life or physical science to question existing explanations. 	A hands-on experiment or discussion will be designed and conducted by students to ask the following questions: Is the physics of blood spatter found on the victim consistent with a contact shot? Does the active ingredient in the super glue fingerprinting development, cyanoacrylate, have a higher affinity (or attraction) to water, salts or oils? Does DNA typing result in an absolute match when comparing identical twins?
<ul style="list-style-type: none"> To demonstrate ways in which science influences and is influenced by complex societies, including political and moral issues. 	Seminars and discussions on ethics, law and science including DNA fingerprinting of all arrestees in California. Comparisons of the US and UK DNA databases.
<ul style="list-style-type: none"> To recognize methods of science, in which quantitative, analytical reasoning techniques are used. 	Interpretation of the output from different spectrophotometer (light measuring) instruments to determine the identity and quantity of chemical substances from crime scenes. The recognition and comparison of both class and individual characteristics of blood from the crime scene compared to the suspect's blood.
<ul style="list-style-type: none"> To understand the learning process and your responsibility and role in it. 	Understanding the course greensheets. "Having a conversation with your textbooks" (Lonna Smith. 2005. 4 th Annual MUSE Faculty Workshop) and reading. Studying and resources (peer mentors – see above).
<ul style="list-style-type: none"> To know what it means to be a member of a metropolitan university community. The following content and activities will be incorporated into the course as you engage in the subject matter of the course: 	The key abilities of a University Scholar are <ol style="list-style-type: none"> Has the Basic Skills for Learning Able to lay a foundation to understand a subject Able to engage in critical inquiry and exploration Takes responsibility as a student and learner Please see the handout from Nellen, A. 2005. 4 th Annual MUSE Faculty Workshop.
1. Issues of diversity.	Diversity of experience, talents, resources, skills, knowledge, backgrounds, cultures, gender, sexual orientation etc. may influence the way in which one perceives any event including those at a crime scene. Understanding that there is value in the diversity of views will be emphasized throughout the course.
2. Writing assignments consisting of a minimum of 1500 words in a language and style appropriate to the subject area of this course.	In addition to your crime scene reports that will consist of a minimum of 1500 words, you will be required to write a research paper that is described in the handout attached. <u>Important Due Dates:</u> Project Proposal/Summary: 7 Sept Optional Outline of Paper: 5 Oct Draft Version of Paper (including citations and reference list), to be submitted electronically (either via e-mail or on PC-readable diskette): 2 Nov Final Version of Paper: 30 Nov
3. Active learning through class participation and discussions.	Small teams will be formed at the first session. Group assignments will be provided throughout the semester in which each team will need to work together to complete the assignment. Examples include student led summaries of special topics for exam reviews, and crime scene documentation using notes, sketches and photographs for reconstruction by a sister team.
4. Assignments and class activities involving critical thinking skills, information competency, critical writing and reading skills, and effective group interactions.	You are required to participate in two MUSE or science-related activities during the semester. This could be a workshop on study skills, attendance at one of the many scientific speaker presentations on

	<p>campus (Geology, Biology, Meteorology, Physics, Chemistry, Justice Studies) or visits to local museums. It could be a visit to the Tech Museum in San Jose, the Exploratorium or Academy of Sciences in San Francisco, or the Lawrence Hall of Science in Berkeley. The MUSE workshops are designed to help you perfect your academic skills, expand your knowledge of how to lead a healthy life, and introduce you to the broader campus life beyond the classroom. A list of the MUSE activities can be found on the MUSE webpage (http://misweb.cob.sjsu.edu/muse2005/allworkshops.asp) for more information.</p> <p>There are some presentations that may be particularly applicable to the content of this course. Justice Studies professionals including forensic scientists, homicide detectives and medical examiners give frequent seminars as a part of the JS 170 Seminar series. Go to the Justice Studies Dept webpage (http://www2.sjsu.edu/justicestudies Internships) and/or the events page at SJSU (http://www.sjsu.edu/events/) or the forensic science student group web page www.fss-sjsu.com. These additional seminars will count for extra credit (1 point each).</p> <p>If you are unsure whether a specific activity will count towards the required three, ask me about it ahead of time.</p>
5. Activities to demonstrate how scientists seek proof for causal relationships between microscopic phenomena and macroscopic observables.	Activities in the course will include actual observations using a microscope to observe evidence in order to "link" the evidence to the suspect. The types of evidence that may be used include questioned documents and hair.
There will be a focus on the following topics ;laws of thermodynamics	The laws of thermodynamics in Arson and explosives investigation.
; structure of matter	Organic and Inorganic Analyses (Carbon and non-carbon containing evidence) for drug investigation.
; interaction of matter and energy	The interaction of energy and matter in firing a gun.
; behavior of physical systems through time	Seminars will cover the evaluation and typing of biological forensic evidence from exhumed bodies, missing soldiers and ancient bones.
; systems of classification	Differences between class and individual characteristics
; physical processes of the natural environment.	Degradation of forensic evidence due to evaporation or mold

Course Text and materials:

Required Text:

CRIME LAB: A Guide for Nonscientists, 2nd. Ed. 2005. ISBN 978-0-9658286-4-2 Calico Press. <http://www.calicopress.com/>

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:

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>

Forensics for Dummies. 2004. Lyle, DP. ISBN 0-7645-5580-4. Wiley Publishing. 402 pp.

Top Shelf Forensics. 2003. Deslich, B and J Funkhouser. ISBN 0-8251-4627-5. J Weston Walsh Publisher. www.walsh.com. 147 pp.

Techniques of Crime Scene Investigation, 2003. Seventh Edition. Barry A. J. Fisher. ISBN: 084931691X. CRC Press LLC. 544 pp.

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

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 2005. John Butler PhD. ISBN: 0-12-147952-8 660 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: Wed Sept 28th Exam 2: Weds Nov 2nd Final: Thurs, Dec 15 0945-1200

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. Total = 50 points

Hands-on Crime scene Exercises and Assignments

Three hands-on crime scene exercises will be required. Each will be worth 10 points. The format and grading of the laboratory reports will be provided at the first laboratory session. Bound notebooks are required for all 3 laboratory reports. Participation in the crime scene exercises will be graded and will be worth 20 points total. Total = 50 points

Project

Important Due Dates:

Project Proposal/Summary: 7 Sept 2005

Optional Outline of Paper: 5 Oct 2005

Draft Version of Paper (including citations and reference list), to be submitted electronically (either via e-mail or on PC-readable diskette): 2 Nov 2005

Final Version of Paper: 30 Nov 2005

Description of Project:

Proposal/Summary: Minimum Length: 100 words Maximum Length: 150 words

Describe why topic is important, the three to four major points you will cover, and a conclusion about what you hope to learn from the project. See attached example. Include a properly formatted reference list with at least three references (minimum of one from Internet and one from scientific journal or book), in proper format (handout to follow). It should be word-processed and double-spaced.

Paper: Minimum Length: 1,400 words

Maximum Length: 1,600 words

Word-processed, double-spaced. With at least three illustrations that convey useful information

At least three references (minimum of one from Internet and one from scientific journal or book), in proper format (handout to follow) Citations given within the text for sources of information (handout to follow)

Oral Presentation: Minimum Length: 15 minutes

Maximum Length: 20 minutes

Use visual aids (overhead transparencies, PowerPoint presentation, webpage, video...)

Practice your talk out loud in front of an audience several times (checking the time). Two class periods before your oral presentation, give out a reading assignment to the students. This can be an article or the URL (web address) of a webpage. The reading should take 20 to 30 minutes for the students to complete.

Points for Project Report Paper:

Proposal	15
Draft Version	30
Final Version	25
Oral Presentation	30
Total	100

Grading

Quizzes	50 points
Exam 1	100 points
Exam 2	100 points
Final exam	100 points
Project Report	100 points
Participation points	20 points
Crime Scene Reports	30 points
Total required	500 points

No late work will be accepted or in-class assignments or exams rescheduled except by prior consent from the instructor or with a written medical excuse. If you have a problem with a given assignment or exam, speak to me before the due date or exam time, not afterwards.

Extra Credit

A total of 20 points may be granted for small group assignments and other assignments during the semester. These may include attending seminars and providing a brief summary of the seminar (no more than 150 words). 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).

Academic Integrity Policy

Academic integrity is essential to the mission of San José State University. As such, **students are expected to perform their own work** (except when collaboration is expressly permitted by the course instructor) without the use of any outside resources. Students are not permitted to use old tests, quizzes when preparing for exams, nor may they consult with students who have already taken the exam. When practiced, academic integrity ensures that all students are fairly graded. Violations to the Academic Integrity Policy undermine the educational process and will not be tolerated. It also demonstrates a lack of respect for oneself, fellow students and the course instructor and can ruin the university's reputation and the value of the degrees it offers.

We all share the obligation to maintain an environment which practices academic integrity. Violators of the Academic Integrity Policy will be subject to failing this course and being reported to the Office of Judicial Affairs for disciplinary action which could result in suspension or expulsion from San José State University.

CHEATING:

At SJSU, cheating is the act of obtaining or attempting to obtain credit for academic work through the use of any dishonest, deceptive, or fraudulent means. Cheating at SJSU includes but is not limited to:

Copying in part or in whole, from another's test or other evaluation instrument; Submitting work previously graded in another course unless this has been approved by the course instructor or by departmental policy. Submitting work simultaneously presented in two courses, unless this has been approved by both course instructors or by departmental policy. Altering or interfering with grading or grading instructions; Sitting for an examination by a surrogate, or as a surrogate; any other act committed by a student in the course of his or her academic work which defrauds or misrepresents, including aiding or abetting in any of the actions defined above.

PLAGIARISM:

At SJSU plagiarism is the act of representing the work of another as one's own (without giving appropriate credit) regardless of how that work was obtained, and submitting it to fulfill academic requirements. Plagiarism at SJSU includes but is not limited to:

The act of incorporating the ideas, words, sentences, paragraphs, or parts thereof, or the specific substances of another's work, without giving appropriate credit, and representing the product as one's own work; and representing another's artistic/scholarly works such as musical compositions, computer programs, photographs, painting, drawing, sculptures, or similar works as one's own.

Academic Integrity Assignment

Academic Integrity policy and consequences can be found at <http://www2.sjsu.edu/senate/S04-12.htm> A self guided on-line tutorial is required of all students:

<http://tutorials.sjlibrary.org/plagiarism/index.htm>

You must complete this tutorial and print out your report at the end.

Bring your results by 31 August. The quiz on 31 August will consist of questions on the academic policy and tutorial.

Finally, there is a seminar on academic integrity on 19 September that we will all attend.

Tentative Course Schedule:

Dates	Topics	Readings
Week 1:	Introduction and Overview of the Course	Handouts & Ch 1
24 Aug	Handouts-Syllabus- Reading material Introductions: Your background, peer mentor backgrounds, my background Course Description, requirements, grading etc. Set up small student groups. What criminalists face at a crime scene; how evidence is collected; who has what job and how they all interact.	

Skills

Having a Conversation with the Text
How to contact your peer mentor
How to read a greensheet.
How to get an email account (and orientation to places on campus where you can log on). <http://www.sjsu.edu/computing/email/>

Assignment 1. Visit On-line tutorial and sign up for MUSE workshops

<http://tutorials.sjlibrary.org/plagiarism/index.htm> and complete quiz. Bring in hard copy by 31 August. Sign up for MUSE workshops on the MUSE webpage <http://misweb.cob.sjsu.edu/muse2005/allworkshops.asp>

Week 2	The Crime Scene	Handouts & Ch 1 & 2
29 Aug	Processing the Crime Scene. Legal Considerations	
	Overview of Criminalistics	
31 Aug	Physical Evidence	
	Common Types of Physical Evidence. The Significance of Physical Evidence.	
	Class vs. Individual Characteristics	
Skills	Being Proactive- (Classroom version of Seven Habits... Covey 1989)	
	How to read effectively.	
	How to take notes effectively.	
	How to search on line library resources at SJSU:	
	http://slisweb.sjsu.edu/resources/liborientation.htm	
	How to find course readings.	
Week 3:	The Crime Scene Continued	Handouts & Ch 2, 3
5 September	Holiday – No class	
7 September	Crime Scene Measurements- Hands-on exercise 1	
	Interpreting blood spatter patterns; sketching the scene and reconstructing events. Jigsaw fits and other matches; packaging and cataloging of evidence; chain of custody issues.	
Skills	Begin with the end in mind- How will your teammates remember you?	
	How to use WebCT for online discussions.	
	How to consult with instructor outside of class.	
	Ingredients for a productive class discussion- Synergizing...	
Week 4	Intro to Physical Evidence continued and Perishable evidence	Ch 4
12 Sept.	Physical Evidence Revisited- Class vs Individual Shoe Characteristics	
14 Sept.	Crime Scene Measurements Revisited	
	Serology and sexual assault evidence; rape kit processing.	
Skills	Putting First Things First- Study habits.	
	How to use WebCT for online discussions.	
	How to consult with instructor outside of class.	
Week 5	Fingerprints and Exam Review	Handouts
19 Sept	Academic Integrity Seminar 1200-1300 Engineering	
21 Sept	Crime Scene Fingerprinting exercise	
	Instructor Exam 1 review	
Skills	Putting First Things First- Study habits II. Review of student review ideas.	
Week 6	Exam 1	
26 September	Student led reviews	
28 September	Exam 1	

Week 7	Organic and Inorganic Evidence	Ch 6
3 Oct	Instrumentation used in Forensic Analyses	
5 Oct	Examples of analytical results Chromatographic separation and Spectrophotometric (light measuring) determination of the identity and quantity of chemical substances from crime scenes.	
Week 8	The Microscope – and other instruments	Ch 6 & 7
10 Oct	Initial Examination- Characterization and Identification The examination and testing of microscopic particles of hair, paint and glass; the Shroud of Turin as an example of a trace evidence case; how the polarizing light microscope works.	
12 Oct	How the scientific instruments work; gas chromatography/mass spectrometry, How IR and UV spectra are put to use; how some evidence in the O.J. Simpson trial was unfortunately presented.	
Week 9	Glass and Soil	Ch 7
17 Oct	The Metric System. Physical Properties. Comparing Glass Fragments. Glass Fractures. Collection and Preservation of Glass Evidence. CSI : Glass Exercise – Reconstruction of a shooting incident	
19 Oct	Forensic Characteristics of Soil. Collection and Preservation of Soil Evidence. CSI Soil Exercise	
Week 10	Reviews for Exam 2	
24 Oct	Microscopy, Glass and Soil exercises revisited	
26 Oct	Instructor led reviews	
Week 11	Exam 2	
31 Oct	Student Led Reviews	
2 Nov	Exam 2	
Week 12	Impression Evidence	Ch 11
7 Nov	Impression Evidence Lecture/Lab How firearms are examined and bullets matched. How toolmarks are compared; the NIBIN and IBIS systems; Photo Essay: Teeth and Jaws.	
9 Nov	Footprint evidence Crime Scene Exercise- Reconstruction part 2.	
Week 13	Trace: Hairs, Fibers, and Paint	Ch 5
14 Nov	Trace evidence collection; looking for clues in the clothing of suspects and victims.	
16 Nov	Forensic Examination of Paint. Collection and Preservation of trace evidence. Crime Scene Exercise- Reconstruction part 2 follow up	

Week 14 Biological Evidence and Questioned Documents Ch 8&9

21 Nov. **Biological Forensics- Searching for Stains, Serology and DNA typing**
23 Nov. **Forensic DNA typing, DNA and Crime**
 Ethics of CSI
 Crime Scene Exercise- DNA role playing

Week 15 Student Presentations

28 Nov Student Presentations 1-4
30 Nov Student Presentations 5-8

Week 16 Student Presentations

5 Dec Student Presentations 9-12
7 Dec Student Presentations 13-17
 Course Review for final exam
 Student Led Final Review

Other Helpful Hints for Success- (Taken from Matters of Life and Death MUSE/Phil 29C, Sec 9 (Area C2) Professor Janet D. Stemwedel-
http://www.stemwedel.org/MUSE/LD_greensheet.html)

Read the assigned readings before class. Some of this reading will be hard! Keep track of questions you have as you do the reading. After you have finished reading a selection, jot down the points that seem to be most important in that selection and the points that are most puzzling. Be ready to discuss the reading in class, even (especially!) if you think you might not understand it completely.

Participate in class discussions. Work with the class to figure out what the readings mean, how they bear on questions of crime scene investigation and forensic science, and why these questions matter. Participation is not just a matter of reporting what the reading says, nor of simply voicing your own opinion. Rather, we will be examining all our assumptions. Participation will involve helping to identify assumptions made by the authors, your classmates, your instructor, and yourself. This requires good listening skills as well as good speaking skills!

Professor's Teaching Philosophy

A seminar is a joint effort of the students and the seminar leader. Your responsibility as a seminar participant is not only to learn, but to help everyone in the seminar, including the seminar leader, to learn.