

CHEM 205

Criminalistics:
the Science
and its
Impact

Dr. Bryant

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Countess Báthory
(1560 - 1614)
one of the most
prolific serial
killers.

Guilty or Innocent?

For serious crimes, a jury must be certain “beyond a reasonable doubt” in order to convict. This legal bar is highly subjective; people disagree all the time on what constitutes reasonable doubt. Criminal forensics attempts to quantify guilt or innocence using scientific principles and data. For example, DNA evidence is capable of indicating that there is a *one in one quintillion* possibility that a defendant is innocent (or guilty). To put things in perspective, one quintillion is ten million times larger than the number of the human beings who have ever lived!



Course Overview

The objective of this course is to provide students with an understanding of forensic science by examining the techniques and instrumentations currently used to analyze chemical, physical and biological evidence. This course also introduces the basic science (chemistry, physics and biology) necessary to comprehend forensics. Students are expected to demonstrate knowledge of basic scientific concepts germane to forensic analysis and crime investigation. This course will also focus on broader aspects of forensic science involving law, media, art, culture and sports. There is both a lecture and laboratory portion to this class. The laboratory component of CHEM 205 will complement the



lecture materials and incorporates practical experience in online research, evidence collection, forensic analyses, data confidence and statistical studies, as well as research into the societal implications of forensic science.

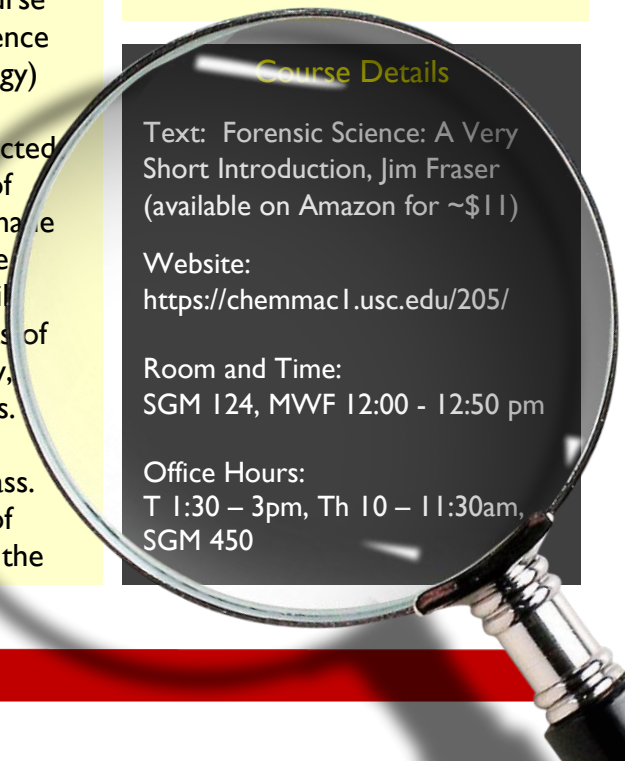
Course Details

Text: Forensic Science: A Very Short Introduction, Jim Fraser (available on Amazon for ~\$11)

Website:
<https://chemmac1.usc.edu/205/>

Room and Time:
SGM 124, MWF 12:00 - 12:50 pm

Office Hours:
T 1:30 – 3pm, Th 10 – 11:30am,
SGM 450



Exams

There will be three midterms and a final. **No make-up exams are given and you cannot take exams at any other time.** An unexcused missed exam will be counted as a zero. For a student with an excused absence, the remaining exams will be weighted more heavily. Students who miss two midterms will automatically receive a MG (missing grade). Contact Prof. Bryant as soon as possible in the case of illness or emergency. All excuses will be verified based on official University policy. A comprehensive final exam will be given Friday, May 3 from 11 am - 1 pm; if you have a time conflict with the final **do not enroll in this class.**

Laboratory Reports

Completing lab reports is required to pass this class. Your lowest lab report score is dropped, however students who do not submit ≥ 2 lab reports will automatically be issued an F. Since labs are 100% internet based, laboratory *attendance* is optional (but recommended). By attending the laboratory period your TA can assist you in completing the exercise. Lab reports are submitted electronically on the course website only. **The course website sends an automated email verifying a lab report was successfully submitted.** Laboratories are due at 5:00 pm one week after your lab section; for example, if your lab section meets Tuesday, January 15, the lab report must be submitted by 5:00 pm on Tuesday, January 22. For late assignments less than



a week late, 50% of the total possible points will be deducted. Assignments over a week late are not accepted. Lab assignments will be digitally analyzed for plagiarism; identical lab assignments from two or more students will receive zero points and will lead to additional sanctions under University rules and guidelines.

JANUARY				
Mon	Tue	Wed	Thurs	Fri
7 Intro	8	9 Forensic Science	10	11 Chemistry
14 Crime Scenes	15	16 Glass	17	18 Glass & Explosives
21 HOLIDAY	22 Lab 1 Meets	23 Explosives Lab 1 Meets	24 Lab 1 Meets	25 Explosives
28 DUIs	29 Lab 2 Meets	30 Functional Groups Lab 2 Meets	31 Lab 2 Meets	

FEBRUARY				
Mon	Tue	Wed	Thurs	Fri
				1 Poison
4 EXAM 1	5 Lab 3 Meets	6 Ballistics Lab 3 Meets	7 Lab 3 Meets	8 Ballistics
11 Ballistics	12 Lab 4 Meets	13 Techniques Lab 4 Meets	14 Lab 4 Meets	15 Fibers

FEBRUARY (cont'd)				
Mon	Tue	Wed	Thurs	Fri
18 HOLIDAY	19 Lab 5 Meets	20 Fiber Lab 5 Meets	21 Lab 5 Meets	22 Fiber
25 Documents	26 Lab 6 Meets	27 Documents Lab 6 Meets	28 Lab 6 Meets	

MARCH				
Mon	Tue	Wed	Thurs	Fri
				1 DNA
4 EXAM 2	5	6 DNA	7	8 DNA
11 SPRING	12 BREAK	13 --	14 NO	15 CLASSES
18 DNA Cases	19 Lab 7 Meets	20 Arson Lab 7 Meets	21 Lab 7 Meets	22 Arson
25 Arson	26 Lab 8 Meets	27 Toxicology Lab 8 Meets	28 Lab 8 Meets	29 Toxicology

APRIL				
Mon	Tue	Wed	Thurs	Fri
1 Toxicology	2 Lab 9 Meets	3 Blood Lab 9 Meets	4 Lab 9 Meets	5 Blood
8 EXAM 3	9 Lab 10 Meets	10 Blood Lab 10 Meets	11 Lab 10 Meets	12 Blood
15 Serology	16	17 Serology	18	19 Fingerprints
22 Innocence Project	23	24 Case Study	25	26 Wrap-Up
29	30			

MAY				
Mon	Tue	Wed	Thurs	Fri
		1	2	3 FINAL EXAM

Lecture
 Exam Day
 No Lecture

lab and lecture schedule



Additional Contact Information

Lab Instructors

Prof. Rebecca Broyer	Prof. Thomas Bertollini
SGM 305	SGM 310
rbroyer@usc.edu	tbertoli@usc.edu

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Support Systems:

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.

Provides overall safety to USC community. dps.usc.edu