

# CHEM 205

Criminalistics:  
the Science  
and its  
Impact

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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 septillion* 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

Time:  
MWF 12–12:50 pm, SGM 124

Office Hours:  
See course Blackboard site

Text:  
none!

## Exams

There will be three midterms and a final administered in-person. **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 the professor as soon as possible in the case of illness or emergency. A comprehensive final exam will be given 5/6 from 11 am – 1 pm; if you have a time conflict with any exam **do not enroll in this class.**

## Laboratory Reports

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 will be submitted to gradescope.com (more information can be found on the course Blackboard site). Laboratories are due at 5:00 pm on Sundays. No late assignments will be accepted. Your lowest lab report score is dropped, however students who do



not submit at least 7 satisfactory lab reports will automatically be issued an F.

- lecture
- exam day
- no lecture

## Lab and Tentative Lecture Schedule

Lab reports are due 5pm on the Sunday following the week they are listed.

| JANUARY     |             |                          |             |                    |
|-------------|-------------|--------------------------|-------------|--------------------|
| Mon         | Tue         | Wed                      | Thurs       | Fri                |
| 10<br>intro | 11          | 12<br>legal              | 13          | 14<br>chemistry    |
| 17          | 18          | 19<br>chemistry          | 20          | 21<br>glass        |
| 24<br>glass | 25<br>Lab 1 | 26<br>glass/DUI<br>Lab 1 | 27<br>Lab 1 | 28<br>DUI<br>Lab 1 |

| FEBRUARY          |             |                      |             |                       |
|-------------------|-------------|----------------------|-------------|-----------------------|
| Mon               | Tue         | Wed                  | Thurs       | Fri                   |
| 31<br>poison      | 1<br>Lab 2  | 2<br>poison<br>Lab 2 | 3<br>Lab 2  | 4<br>poison<br>Lab 2  |
| 7<br>poison/fiber | 8<br>Lab 3  | 9<br>fiber<br>Lab 3  | 10<br>Lab 3 | 11<br>EXAM 1<br>Lab 3 |
| 14<br>fiber       | 15<br>Lab 4 | 16<br>DNA<br>Lab 4   | 17<br>Lab 4 | 18<br>DNA<br>Lab 4    |

| FEBRUARY (con't) |             |                    |             |                      |
|------------------|-------------|--------------------|-------------|----------------------|
| Mon              | Tue         | Wed                | Thurs       | Fri                  |
| 21               | 22<br>Lab 5 | 23<br>DNA<br>Lab 5 | 24<br>Lab 5 | 25<br>arson<br>Lab 5 |

| MARCH            |             |                           |             |                           |
|------------------|-------------|---------------------------|-------------|---------------------------|
| Mon              | Tue         | Wed                       | Thurs       | Fri                       |
| 28<br>arson      | 1<br>Lab 6  | 2<br>review<br>Lab 6      | 3<br>Lab 6  | 4<br>EXAM 2<br>Lab 6      |
| 7<br>ballistics  | 8           | 9<br>ballistics           | 10          | 11<br>ballistics          |
| 14               | 15          | 16                        | 17          | 18                        |
| 21<br>toxicology | 22<br>Lab 7 | 23<br>toxicology<br>Lab 7 | 24<br>Lab 7 | 25<br>toxicology<br>Lab 7 |
| 28<br>doping     | 29<br>Lab 8 | 30<br>blood<br>Lab 8      | 31<br>Lab 8 |                           |

| APRIL               |              |                            |              |                          |
|---------------------|--------------|----------------------------|--------------|--------------------------|
| Mon                 | Tue          | Wed                        | Thurs        | Fri                      |
|                     |              |                            |              | 1<br>blood<br>Lab 8      |
| 4<br>serology/blood | 5<br>Lab 9   | 6<br>serology<br>Lab 9     | 7<br>Lab 9   | 8<br>explosives<br>Lab 9 |
| 11<br>explosives    | 12<br>Lab 10 | 13<br>explosives<br>Lab 10 | 14<br>Lab 10 | 15<br>EXAM 3<br>Lab 10   |
| 18<br>anthropology  | 19           | 20<br>documents            | 21           | 22<br>ethics             |
| 25<br>ethics        | 26           | 27<br>case study           | 28           | 29<br>review             |

| MAY |     |     |       |                        |
|-----|-----|-----|-------|------------------------|
| Mon | Tue | Wed | Thurs | Fri                    |
| 2   | 3   | 4   | 5     | 6<br>FINAL<br>11am-1pm |



## 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](http://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, [policy.usc.edu/scientific-misconduct](http://policy.usc.edu/scientific-misconduct).

### Support Systems

*Counseling and Mental Health - (213) 740-9355 – 24/7 on call*

[studenthealth.usc.edu/counseling](http://studenthealth.usc.edu/counseling)

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

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*

[suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention and Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call*

[studenthealth.usc.edu/sexual-assault](http://studenthealth.usc.edu/sexual-assault)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED)- (213) 740-5086 | Title IX – (213) 821-8298*

[equity.usc.edu](http://equity.usc.edu), [titleix.usc.edu](http://titleix.usc.edu)

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following *protected characteristics*: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations. The university also prohibits sexual assault, non-consensual sexual contact, sexual misconduct, intimate partner violence, stalking, malicious dissuasion, retaliation, and violation of interim measures.

*Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298*

[usc-advocate.symplicity.com/care\\_report](http://usc-advocate.symplicity.com/care_report)

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

*The Office of Student Accessibility Services - (213) 740-0776*

[osas.usc.edu](http://osas.usc.edu)

USC welcomes students with disabilities into all of the University’s educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the [OSAS process](#) (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a

Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at [www.osas.usc.edu](http://www.osas.usc.edu). You may contact OSAS at (213) 740-0776 or via email at [osasfrontdesk@usc.edu](mailto:osasfrontdesk@usc.edu)

*USC Campus Support and Intervention - (213) 821-4710*

[campussupport.usc.edu](http://campussupport.usc.edu)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](http://diversity.usc.edu)

Information on events, programs and training, the Provost’s Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu)

Non-emergency assistance or information

