Syllabus for CHM 500 – Spring 2023

Safety and Ethics

Instructor:	Lorenzo Mosca
Class Meetings:	M 1:00 pm – 1:50 pm
Where:	Beaupre 215
Student Hours:	T 12:30 pm – 2:00 pm If you wish to schedule outside the above time, please notify me with at least 24 hours of advance notice using a method of your choice (in person, email, Slack, phone call). Remote office hours are possible as an option (Zoom).
Where:	Beaupre 325D
How to contact me:	lorenzo@uri.edu: preferred, **put CHM 500** in the object or Slack. (401) 874-2364 Office: 325D Beaupre Center for Chemical and Forensic Sciences

Reference Books (not mandatory, suggested):

→ Safety in Academic Chemistry Laboratories: Best Practices for 1st and 2nd Year University Students. | 8th Ed. | ACS | *Download here* ↓
https://www.acs.org/content/dam/acsorg/about/governance/committees/chemicalsafety/publications/safety-in-academic-chemistry-laboratories-students.pdf

→ Scientific Integrity: Text and Cases in Responsible Conduct of Research by *Francis L. Macrina* | 4th Ed. | Wiley

Other materials: Lecture slides, presentations created by other students, reading assignments.
Slack Channel. Your classroom notes.

Course website: We will mostly use the Slack workspace.
Join the Slack Workspace here ↓
https://join.slack.com/t/chm500safetyandethics/shared_invite/zt-1n0zd2hr9-bktkNB8N0QeRgTQw0stKng
Redundant materials will be put on Brightspace (https://brightspace.uri.edu)

Course description: This course will equip first-year graduate students with the tools needed to: ① perform chemical research in safety and ② conduct research with integrity. Both are the basic tenets for successful graduate and post-graduate careers; their importance extends to all implementations of chemistry in any profession. Chemistry laboratories are full of physical, chemical and possibly biological hazards and navigating them should not be a confusing task. We will discuss how to ethically conduct research, including a brief survey of Design of Experiments (DOE) and how to recognize and avoid forms of plagiarism. We will analyze case studies regarding safety, plagiarism and scientific misconduct.

Course pre-requisites: Graduate standing or permission of the instructor.

Course requirements

- → Attendance will be taken (*see: Class Policies*)
- → Prepare and present **two Safety Minute** presentations (*see: Safety Minutes*)
- → Complete the ACS Reviewer Lab training (*see: Peer Review*)
- → Two **Peer Review Reports** (*see: Peer Review*)
- → One **Safety presentation** (*see: Safety and Ethics Presentations*)
- → One **Ethics presentation** (*see: Safety and Ethics Presentations*)
- → One **SOP Document** (*see: SOP*)
- → Class participation (*see: Class Policies*)

Class Calendar and Topics

01/23/23	**M**	**First day of classes (including CHM 500) |** Introduction, Safety in the laboratory
01/30/23	M	Responsibilities for safety, Definitions, Chemical hazards
02/06/23	M	Laboratory techniques, Safety equipment, Emergency response
02/13/23	M	Some case studies, *ACS Reviewer Lab due, SOP topics due*
02/20/23	**M**	**Presidents' Day | Class does not meet**
02/27/23	M	Safety Presentations
03/06/23	M	Safety Presentations
03/13/23	**M**	**Spring Break (03/11 – 03/19) | Class does not meet**
03/20/23	M	Safety Presentations | Ethics and scientists (if it fits), *SOP due*
03/27/23	M	Ethics and scientists
04/03/23	M	Authorship, Collaborations, Peer review
04/10/23	M	Plagiarism, Research data, Design of experiments, *Peer review report 1 due*
04/17/23	M	Record keeping, Intellectual property
04/24/23	M	Sabotages, Poisonings, Data and image fabrications, *Peer review report 2 due*
05/01/23	M	*Buffer* for Presentations
05/08/23	**M**	**11:30 am – 1:30 pm | Ethics Presentations**
05/16/23	**T**	**Final Grades are Due**

Note: All classes and presentations will be given in Beaupre 215.

Grading

Your final grade will be computed using against a total of 600 points, distributed as follows:

① Attendance (50 points),
② Safety Minutes (two, 25 points each)
③ ACS Reviewer Lab (50 points)
④ Peer Review report (two, 50 points each)
⑤ Safety Presentation (100 points)
⑥ Ethics Presentation (100 points)
⑦ SOP Document (100 points)
⑧ Class Participation (50 points)

There will be no makeups on presentation work. Presentation calendars will be drafted to accommodate possible absences. In the case of last-minute changes, you are responsible for finding a suitable arrangement-switch with your colleagues. Missed presentations will receive 0 points. I will grade according to a scale no stricter than the one reported below.

Re-grading policy. You may request a re-evaluation of your work for up to 7 days after the return of your evaluation. Extra-credit will not be offered for this course.

93% – 100%	**A**	**4.0**	**73% – 76.9%**	**C**	**2.0**
90% – 92.9%	**A–**	**3.7**	**70% – 72.9%**	**C–**	**1.7**
87% – 89.9%	**B+**	**3.3**	**67% – 69.9%**	**D+**	**1.3**
83% – 86.9%	**B**	**3.0**	**63% – 66.9%**	**D**	**1.0**
80% – 82.9%	**B–**	**2.7**	**60% – 62.9%**	**D–**	**0.7**
77% – 79.9%	**C+**	**2.3**	**0% – 59.9%**	**F**	**0**

Your part – Here are a few points where your full commitment is required:

- → Note-taking – Feel free to take plenty of notes, share them with your colleagues, read them/reorganize them before the next class.
- → Do your part in the class – this includes obvious things, such as trying not to get distracted, taking part in activities according to what you are comfortable with, ask me to slow down or go over it once again if something is not clear.
- → Ask me/your colleagues questions – the *rule of the class* is that there is no such thing as a stupid question.
- → Practice, practice, practice! Presenting any kind of work is an acquired skill. Practice your presentations. A rule of thumb is that presentation should be rehearsed fully the day before your scheduled time. Fully rehearsing a presentation before class will not help.
- → Use the opportunity of more facetime during student hours!
- → Be ready to challenge yourselves and to critically review your work.

It is my utmost priority to ensure that your learning takes place in a respectful, safe, and constructive environment. I will not tolerate aggressions and any other actions based upon prejudice and intolerance. As a group of people with biases, we shall learn how to understand and work with our differences. Equity and inclusion are critical components for campus community members to thrive and become responsible citizens of the World. If you are a target or a witness of a bias incident, you are encouraged to submit a report to the URI Bias Response Team at www.uri.edu/brt. There you will also find people and resources to help you.

Safety Minutes

What are safety minutes? Safety minutes (or safety moments) are very short presentations given to an audience before the start of an event, for example a group meeting, a progress report meeting, or lectures and large seminars. Their goal is to briefly inform the audience of safety-related engineering controls and other safety topics. Safety minutes are very specific (because of time constraints) and are usually in the format of 1–3 slides with graphics and text. Think of them as the safety message you receive before taking off on a plane, but shorter and without *props*.

Throughout the course we will develop a library of Safety Minutes with the hopes of sharing them with the department and EHS, so that they can be used freely. I will give you the first couple of safety minutes, however, you will develop your own starting **from week 3**. Each student will prepare **two Safety Minute presentations**. For a choice of topics see Slack. I suggest that each student prepares presentations related to their research field or to the research field of their research group. **You should aim for 3-minute presentation time**. I will provide you with a basic template that contains some necessary information, but you may use your own style and design. Presentations are **due** on the **Saturday (by 10:00 pm)** prior the day you are scheduled to present.

See at the end of the syllabus for a grading rubric.

SOP

You will develop a safety oriented standard operating procedure / protocol for this course. I vividly recommend picking a safety issue or protocol that is relevant to your research laboratory and project. You must have your SOP topic selected and approved by the instructor by Monday, February 13 (10:00 pm). Your topic could be anything relevant to chemical handling or disposal, for example: "handling and disposal of mercury compounds", or "handling of cryogenics liquids". You will be provided with a template to follow. A complete draft of the SOP is due on Monday, March 20, by 10:00 pm. Together, we will work on refining the SOP and have it approved by EHS. Full credit will be given upon completion of the draft.

Peer Review

① **You must complete the free ACS Reviewer Lab course** (< 2 hours) online at this address:
https://institute.acs.org/courses/acs-reviewer-lab.html
This brief course shows you the ropes of peer review with a particular focus on the chemical sciences. You must send me a confirmation email showing that you completed the course by and not later than Monday, February 13 at 10:00 pm.

② **ChemRxiv paper review.** Together as a class, we will select a pool recently posted papers on the pre-print archive ChemRxiv. Papers in the pool will be selected according to your preference and relevance to your research and interests. You will be assigned two papers from the pool with two priority dates. Two students will be assigned the same manuscript, but your peer-review assessments should be done independently. You must turn in your first assessment by Monday, April 10, no later than 10:00 pm and your second assessment by Monday, April 24, no later than 10:00 pm. Review reports should be about 1 page (max. 2 pages), with standard margins and font size 12.

See at the end of the syllabus for a grading rubric.

Safety and Ethics Presentations

Each student will prepare one presentation on a safety topic and one presentation related to an ethics / scientific misconduct topic. You have the choice to select anything of your liking, but it must be relevant to chemistry or an adjacent area. Follow the guidelines below when preparing for your presentations.

- → Topics for the Safety Presentations are due on Monday, February 20 by 10:00 pm.
- → Topics for the Ethics Presentations are due on Monday, April 24 by 10:00 pm.
- → There should be no repeats or topic overlaps within the class, so please discuss among yourselves to avoid possible repeats.
- → Aim for a 10–12-minute presentation and about 5 minutes of Q&A.
- → Use whatever style and design you want. The presentation must be pleasing and commensurate with the level of the class.
- → A **first draft** of your presentation is due on the **Wednesday (by 10:00 pm) prior to the Monday** you are scheduled to give it. I will then provide you with some feedback regarding the construction of the presentation within 48 hours (i.e., by Friday evening). Use that time to practice and refine your presentation.
- → A carefully constructed presentation leaves space for a few questions.
- → Students who are not presenting should pay attention and participate in the discussion.

See at the end of the syllabus for a grading rubric.

Class Policies

A. Attendance

You are required to attend this class and attendance will be taken at each class period. You must notify the instructor with sufficient advance if you are unable to attend class. Justifiable absences include illness or injury, religious observances of holy days, grievance, or participation to school-mandated events. It is your sole responsibility to communicate with me prior to the classes. For classes, it is your duty to make-up for the missed work. I will be offering you to makeup in-person or virtual lectures during the next available student hours or at a time that suits both of us. **Important!** You **do not need to present a doctor note**, or a justification letter. It suffices for you to let me know that you won't be coming to class.

B. Class participation

This class is built upon a discussion of topics involving safety, ethics and case studies. You should participate in the discussion. Questions, comments and rebuttals are more than welcome. Say something in each class period. Remember the class rule: there is no such thing as a stupid question*!*

C. COVID-19

Masks are required in this class, regardless of your vaccination status. Please wear your mask! The University is committed to delivering its educational mission while protecting the health and safety of our community. While the university has worked to create a healthy learning environment for all, it is up to all of us to ensure our campus stays that way.

As members of the URI community, students and instructors are required to comply with standards of conduct and take precautions to keep themselves and others safe. Visit web.uri.edu/coronavirus/ to keep yourself up to date with the latest guidance about the URI COVID-19 response. **Important**! Do not attend class if you show any symptoms of COVID-19 or related respiratory illness. Instead, you should go get tested. Notify me of your absence before the start of class by email: lorenzo@uri.edu, or phone: (401) 874-2364, or through Slack.

D. Communication with the Instructor

Phone: (401) 874-2364.
Email: lorenzo@uri.edu, **must include CHM 500** in the object.

I expect to get back to you as soon as possible within 24 hours during weekdays. Emails and messages received after 8:00 pm will be addressed at my earliest convenience or on the next available weekday.

E. Drops and Withdrawals

Missing attendance for the first two class meetings (without notifying me) will result in removal from the class roster. You can drop this class until the third week of classes (02/13/2023). You can withdraw (W on transcript) until 03/06/2023.

F. Academic Honesty and Integrity

You are expected to be honest in all academic work. Your name on any written work or exam shall be regarded as assurance that the work is the result of your own independent thought, study and effort. You have an obligation to know how to quote, paraphrase, summarize, cite and reference the work of others with integrity. The following are examples (non-comprehensive) of academic dishonesty:

- → Using material, directly of paraphrasing, from published sources without proper citation
- → Claiming disproportionate credit for work not done independently
- → Unauthorized possession or access to exams
- → Unauthorized communication during exams
- → Unauthorized use of another's work or preparing work for another person
- → Taking an exam for another person

- → Altering or trying to alter grades
- → The use of notes/text or electronic devices to gain an unauthorized advantage during exams
- → Fabricating or falsifying facts, data, or references
- → Facilitating or aiding another's academic dishonesty

The university policy on academic honesty is clear. Any incidence of academic dishonesty (see above or URI's Student Handbook), will result in either one or all of the following: a grade of zero, failure of the course, formal notification to the Dean.

G. Electronics and Recording

You may not record any audio and/or video of lectures, student presentations, or student hours *without in-writing permission from all individuals present*. You may choose to take your notes in writing or typing, but your use of electronic devices (laptop, iPad, tablets) should not disrupt the lecture, the instructor, or your colleagues. The use of electronic devices must be limited only to course-specific tasks. Refusal to comply will result in dismissal from the course.

H. Disability Accommodations

Please notify me with your Disability Access and Inclusion (DAI, formerly DSS) accommodation letter as early as possible. I will be happy to discuss and arrange for your approved academic accommodations. If you have not yet established services through DAI, please contact them to engage in a confidential conversation about the process for requesting reasonable accommodations in the classroom. DAI can be reached here: (401) 874-2098, web.uri.edu/disability, https://web.uri.edu/disability/request-form/ email: dai@etal.uri.edu.

I. Student Resources

Your success in this class and as graduate student is very important to me. If you struggle with the course materials or requirements do not hesitate to contact me so that we can discuss possible solutions. Additional resources are available to you as a member of URI Graduate School.

- → The Graduate Writing Center provides writing support to all URI doctoral and master's students to foster continuing development of academic and professional writing skills necessary to succeed in graduate programs and academic or professional careers. Options include 1) one-on-one consultations, 2) writing focused workshops and programs, 3) writing groups, and 4) support for English Language Learners. For more information, visit https://web.uri.edu/graduate-writing-center/. View availability and book an appointment online at https://mywco.com/URIGradWC.
- → Wellness Resource Center (WRC) – provides a relaxing atmosphere and a safe, comfortable space for you to escape the stresses of life. The WRC is located on the lower level of the Anna Fascitelli Fitness and Wellness Center.
- → Campus Recreation offers free memberships to their facilities (included in your tuition). Access includes the Fascitelli Fitness and Wellness Center, Mackal indoor courts, cardio and weight rooms, Tootell Aquatic Center, and numerous other facilities and group classes. https://web.uri.edu/campusrec/facilities/
- → *Well-being Coaching* offers one on one meetings with a certified Well-being Coach, who is trained to identify your strengths and support you with a goal or behavior change. Your coach will guide you holistically and support you through day-to-day struggles. https://web.uri.edu/campusrec/well-being-coaching/ or wellcoach@etal.uri.edu

J. Changes to the Syllabus

Due to unforeseen circumstances, the contents of the syllabus and the content of the course may be subject to changes. You will be notified of any change in advance.

Peer Review Rubric (100 pts)

1. **Summary of the manuscript is provided in one or two sentences.** _____/ 10 pts

2. **A general assessment of the quality of the paper is given.** _____/ 20 pts
   Think about a bird's eye view that includes novelty, impact on the field, technical accuracy. Be cautious, without knowing what journal the authors are targeting, it's hard to assign an objective value.

3. **Has the reviewer given a Critique?** _____/ 25 pts
   Discuss specific sections of the manuscript, in the order in which they appear: for example, Abstract, Introduction, Results, Conclusions, Methods, References, Supporting Information; Figures might be discussed separately. Is each section in the same presentation style? Focus on consistency and integrity of the premise / hypotheses / results / methods. Are results reliable? Are conclusions supported by data? Are there missing / unexplained things? Can we trust these conclusions? Are there "fatal mistakes"? Comment briefly about the quality of presentation. Is it understandable? Is it great / sufficient / poor writing? We are not picking at the English or its grammar here (remember that north American and Asian journals and authors mandate or favor the use of AE, while European journals favour BE). In real-world publishing, copyeditors will take care of things such as typos, formatting, minor grammar and lexical mistakes, readability issues.

4. **Suggestions for improvement?** _____/ 25 pts

5. **Did you provide an impersonal, impartial, constructive review?** _____/ 20 pts

Presentation Evaluation Rubrics

Safety Minute (25 pts) Date:_____ Presenter: _____

6. **Timing.** _____/ 7 pts
   Maximum allotted time is 3 minutes. You must deliver an effective safety minute with 1–3 slides.

7. **Technical Content.** _____/ 7 pts
   Your safety minute should deliver a highly specific topic related to chemical / physical / biological hazards and engineering controls / policies aimed at reducing said hazards. “Corrosive chemicals” or “Compressed gas cylinders” are too general and vast topics; however, “Chemical burns from strong acids” or “Storage and handling of flammable gases” are specific enough. Your content should be technical enough and should follow this flow: ① Identification of hazard, ② Explanation of risk, ③ Policies, ④ Removal of risk, ⑤ Safe practices and engineering controls, ⑥ References. Your delivery must show that you master the content of your safety minute, and that you can field reasonable questions. *Note: unreasonable questions could be possible during a safety minute—you should be able to deal with them too.*

8. **Slides.** _____/ 7 pts
   Your slides should be carefully crafted and visually pleasing. Your presentation must be logically flawless in its progression from the beginning to the end. In addition to those, keep in mind that your score will be evaluated by checking the following parameters: ① Consistency, ② Balanced use of text and graphics, ③ General layout and design elements (e.g., positive/negative space, color use, fonts, organization).

9. **Citations and Referencing.** _____/ 4 pts
   You must cite sources, reference images, and give credit where it’s due.

Safety Presentation (100 pts) Date:_____ Presenter: _____

1. **Timing.** _____/ 20 pts
   Aim for a total of 15 minutes. You must deliver an effective presentation in 10–12 minutes and allow about 5 minutes of discussion (ca. 10 slides).

2. **Slides.** _____/ 20 pts
   Your slides should be carefully crafted and visually pleasing. Your presentation must be logically flawless in its progression from the beginning to the end. In addition to those, keep in mind that your score will be evaluated by checking the following parameters: ① Consistency, ② Balanced use of text and graphics, ③ Why is something there if you are not talking about it? / Why are you talking about something if it's not there? ④ General layout and design elements (e.g., positive/negative space, color use, fonts, organization).

3. **Contents.** _____/ 20 pts
   Your presentation should deliver a selected topic related to a case of chemical or biological accident. Your content should be technical and focus on the following outline. ① Why am I interested in this specific event? ② What happened? ③ Analysis of risk, what went wrong? What were the outcomes? ④ What should have been done? ⑤ Long-term outcomes, changes of policies and safe practices, ⑥ Summarize current safe practices / engineering controls, ⑦ Your final comments / remarks, ⑧ References. Your delivery must show that you master the content of your presentation and that you can field reasonable questions. *Note: unreasonable questions could be possible—safety is a topic that few may find "subjective".*

4. **Delivery.** _____/ 20 pts
   Delivery of your presentation should be adequate to the classroom. Content should be explained at a level understandable by everyone in the audience. Are you delivering a tailored presentation? *Note: I prefer to use the term "integrity", which is much more encompassing, instead of "professionalism".*

5. **Citations and Referencing.** _____/ 20 pts
   You must cite sources, reference images, and give credit where it's due.

Note: The Ethics presentation rubric will be the same. Contents rubric changes as follows:
[Your presentation should deliver a selected topic related to a case of ethical issues / scientific misconduct. Your content should be technical and focus on the following outline. ① Why am I interested in this specific event? ② What happened? ③ What are the ethical implications discussed here? ④ What should have been done? ⑤ What is the current position on the matter? ⑥ What have we learned / What outcomes to avoid the same issue? ⑦ Your final comments / remarks / could we have done better? ⑧ References. Your delivery must show that you master the content of your presentation and that you can field reasonable questions.]