

Monday 2:00-4:50p, Location SI 3095

Instructor: Dr. Megan E. Filbin-Wong

Contact: mfilbin1@msudenver.edu

(please put CHE 4960 in e-mail subject line)

Office Hours: M 10:00a-1:00p, T 12:00-2:00p or by appointment

Office: SI 3055 (or my lab, SI 3097)

What Makes This Course Awesome?

Senior Experience in Biochemistry is the culmination of your baccalaureate studies here at MSU Denver. In this course, you have the chance to explore and become well versed about a biochemistry topic that is of interest to you, and discuss that topic in both an oral and written platform with a degree of sophistication that goes above and beyond your previous chemistry coursework.

What Is Expected of You?

Throughout this course, you will be challenged to research, review, and discover information about a chemistry topic of interest and complete the following:

- Informal oral discussion where you refute a scientifically incorrect advertisement by providing clarification.
- Lay summary (one that a non-scientist can understand) about current research published concerning your chosen topic.
- Research plan where you pose a thoughtful question, hypothesis and experimental methods to address your question.
- Formal oral PowerPoint presentation where you introduce your chosen topic and discuss your research plan to both your classmates as well as some chemistry faculty members.

How can you complete this?

- Regular Attendance & Participation – This course is not designed to be a lecture course; rather, it is designed to provide a platform for discussion. If you do not attend, or attend without participating or contributing to discussions, the course will be of little benefit to you.
- Frequent Research & Time Management – It is **absolutely imperative** that you spend time researching your topic of interest. This aspect of the course is meant to be a challenge; if you do not understand something, write down the question and take the time to figure it out (ask your peers, professors, textbooks...etc.). Your research should NOT be conducted in one day or weekend, but recur throughout the semester. Plan your time wisely.
- Apply & Challenge Yourself – Your growth and understanding as a chemist relies on you. Approach this course with the same determination you would have as a junior member of an industrial lab or graduate program.

What Can You Expect from the Instructor?

I will lead clear and on-time discussions, define your learning objectives for each assignment and encourage class participation throughout the course. Your assignments will challenge you to demonstrate your topic mastery and I will grade each assignment accordingly (see below). If you are unable to see me during my office hours, I will be flexible with my time to ensure your questions are answered and your concerns are addressed.

Required Materials

- Robinson, Marin. Stoller, Fredricka. Costanza-Robinson, Molly. Jones, James K. Write Like A Chemist: A Guide and Resource. Oxford University Press: 1st Edition. 2008
ISBN-13: 9780195305074
ISBN-10: 0195305078
- OPTIONAL: Tufte, Edward. The Visual Display of Quantitative Information. Graphics Press: 2nd Edition. 2001
ISBN-13: 978-0961392147
ISBN-10: 0961392142

Class Participation

At the beginning of the course, we will primarily review and critique written and oral presentations via in-class discussions. You are expected to watch the assigned videos and read each assignment, be present and participate in class discussions, and fill out the peer-evaluation forms for credit. Also, you are expected to attend the guest seminar and blog on Blackboard when assigned throughout the semester. Attendance is crucial for this course; chronic truancy or disruptive behavior will be noted and reflected in your grade. Class participation is worth 10 % of your grade.

Informal Oral Discussion

During the second week of the course meeting, you will be required to give a 10 minute, informal refutation to a scientifically incorrect advertisement provided by the instructor. You will have the use of the whiteboard if needed, and you are expected to lead your discussion based on the Calling Bullsh*t videos assigned below. The goal of this assignment is to learn techniques to recognize when science is falsely presented and how to tactfully clarify the issue, as well as to get you “warmed-up” and comfortable with class discussions. Your discussion is worth 5 % of your overall grade.

Lay Summary

A lay summary is a brief summary of a complex or technical topic written in such a way that someone with high school science background can comprehend the information. **You are required to find one research publication about your chosen topic and summarize the report in lay terms, in five double-spaced pages, including a minimum of one figure from the research publication.** You will be required to have a draft of your lay paper reviewed in the Writing Center or by a Chemistry Faculty member, with a reflection form filled out for credit (see below). A draft of your lay summary is due on week 7 and will be reviewed by your peers and the instructor during class. Your final lay paper is due week 9, and is worth 100 points and 20% of your overall grade. The Writing Center Reflection Form is worth 2.5% of your overall grade (22.5 % total). For each day your assignment is late, 5 points will be deducted from your lay summary final grade. Assignments will not be accepted later than seven days from the due date.

Research Plan

Scientists are not only capable of carrying out technical experiments, but are capable of finding a gap in knowledge about a particular topic and proposing a method for determining unknowns. As your final assignment in the class, you are tasked with developing a research plan as an expert in the area of your chosen topic. **In your research plan, you will be required to introduce your topic, pose a question and hypothesis, then propose one experimental method to answer your question. On top of this, you are required to state your expected outcomes/results and an alternative approach/method in 5-10 pages, doubles-spaced, with 15 peer-reviewed references.** Like your Lay Summary, you are required to have a draft of your Research Plan reviewed in the Writing Center or by a Chemistry Faculty member. A draft of your lay summary is due on week 12 and will be reviewed by your peers and the instructor during class. Your final research plan is due on the day/time of the ACS D.U.C.K. exam during finals week, and is worth 100 points and 30 % over your overall grade. The Writing Center Reflection Form is worth 2.5% of your grade (32.5 % total). Your research plan assignment is absolutely due on the day/time of the final exam – no late assignments will be accepted.

Formal Oral PowerPoint Presentation

Your final oral presentation will be given to you peers as well as chemistry faculty members as a PowerPoint presentation in 15 minutes, followed by a five-minute Q & A session during weeks 15 and 16. **You will be expected to provide background information, current research, and your proposed research plan about your chosen topic.** Given this is the culmination of your research, you will be evaluated as a *chemistry aficionado* with both content expertise and clear, precise communication techniques. Your final oral presentation is worth 30% of your overall grade.

Please note that there is no limitation to the range of questions you may receive; you may be asked questions that test your general, analytical, organic, and inorganic or biochemistry knowledge. Do not be fearful of this – see it as a challenge to demonstrate your knowledge, push yourself to clarify your understanding, or learn something new.

Writing Center or Faculty Writing Review

Your two final written documents must be reviewed by either tutors in the Writing Center or by a faculty member in the Chemistry Department, and a Reflection Form filled out by you for credit. The Writing Center, located in King Center 415, can help you with any aspect of your writing, from generating ideas to supporting your arguments to organizing to editing for style. For the current schedule or to make an appointment, visit the Writing Center's website at <https://www.msudenver.edu/writectr/> or call 303-556-6070. In lieu of a Writing Center tutor, you may review your lay summary or research plan with a department faculty member (which will be particularly helpful for your research plan). It is **absolutely critical** that you review the syllabus and **make appointments with tutors as well as faculty members well in advance!** The Writing Center tutors as well as department faculty members will typically be *incredibly limited in availability* after the middle of the semester. **It is the responsibility of the student to schedule meetings with the Writing Center tutors and department faculty members.**

REFLECTION FORM: The Reflection Form can be found here:

<http://msudenver.edu/writectr/studentresources/writingcentersessionreflectionform/> on the Writing Center website. Simply fill out the form, then bring the form to the Writing Center to have it stamped or signed by a faculty member.

Final Exam

The ACS D.U.C.K. (Diagnostic of Undergraduate Chemistry Knowledge) exam will be administered as the final exam for the class. The exam itself will not constitute part of your overall grade (diagnostic metric for the Provost), however you are expected to prepare for the exam and complete it as if your performance was graded. The final is required for all students and will be given during finals week in December (05/07, time TBA).

Specific, Measurable Student Behavioral Learning Objectives

Upon completion of this course, the student should be able to:

- 1) Use current topics as a source of information regarding chemical information.
- 2) Use Chemical Abstracts as a source of information regarding chemical information.
- 3) Utilize current computer technology as a source of information regarding chemical information.
- 4) Use current formatting techniques for the presentation of publishable chemical information.
- 5) Write a senior thesis in a format appropriate to current chemical journals.
- 6) Prepare visuals for the oral presentation of chemical information.
- 7) Present an oral presentation of the senior thesis work.

Grade Calculation

If you have at least 92.0% you have earned an A. The cutoffs for the other scores are: 90-91.9% (A-), 88-89.9% (B+), 82-87.9% (B), 80-81.9% (B-), 78-79.9% (C+), 72-77.9% (C), 70-71.9% (C-), 68-69.9% (D+), 62-67.9% (D), 60-61.9% (D-), and less than 60% will be an F. *If you are caught plagiarizing any assignment or in any way committing academic dishonesty (fabrication, helping others cheat, etc.), you will receive an automatic F on that assignment. Repeat offenders may face a permanent F for the course, at the discretion of the instructor.*

Participation	10
Informal Oral Discussion	5
Writing Center Reflection Form 1 (Lay Paper)	2.5
Lay Summary Paper	20
Writing Center Reflection Form 2 (Research Plan)	2.5
Research Plan	30
Formal Oral PowerPoint Presentations	30
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Total	100%

Percentages are tentative and subject to change by the instructor.

Please keep track of your grades throughout the semester. If you are struggling to determine exactly what your grade is, please come to my office hours or schedule an appointment to see me in person. Final grades will be available by web and kiosk on May 18th at <http://connectu.msudenver.edu>. ***The Family Educational Rights and Privacy Act prohibit me from releasing your grades via phone or email unless you register with the Registrar's office and obtain a non-identifying security code.***

MSU Denver College of Letters, Arts & Sciences Administrative Policies

For information regarding withdrawals, incompletes, academic integrity, sexual misconduct, accommodations to assist individuals with disabilities, attendance on religious holidays, electronic communication and Fresh Start, please see CLAS Policies posted on Blackboard or visit:

https://msudenver.edu/media/content/departmentofchemistry/CLAS_Syllabus_Policies_Spring_2018..pdf

Syllabus Changes & Policy

Any changes in this syllabus I may deem necessary during the semester will be announced in class and made available in writing. I reserve the right to revise the syllabus and grading policies at any time.

Week	Dates	Course Meeting Topic	Assigned Reading*	What's Due?
2	01/22	Course Intro & Expectations Biochemistry in the Mainstream: Calling Bullsh*t		
3	01/29	Refuting Bullsh*t Presentations Introduction to Writing 1: Primary Literature	Videos 1-7	
4	02/05	Student Critique of Articles 1 & 2 Discuss Selection of Research Topic & Article	Articles 1 & 2 Robinson Text: Chapter 2 (eventually Module 1)	
5	02/12	Brief Discussion of Research Topic Article Introduction to Writing 2: Lay Summary	Robinson Text: Chapter 2 (eventually Module 1)	
6	02/19	Student Critique of Lay Summary	Lay Summary Guidelines Article 3	
7	02/26	Lay Summary Draft Peer Review	Robinson Text: Chapter 1 and Appendix A	Lay Summary Draft
8	03/05	Introduction to Writing 3: Research Plan		Lay Summary & Reflection Form
9	03/12	Student Critique of Research Plan Article 4	Research Plan Guidelines Article 4	
10	03/19	SPRING BREAK!! ☺		
11	03/26	Research Plan Draft Peer Review	Robinson Text: Chapter 11, Appendix B (pgs. 664-5)	Research Plan Draft
12	04/02	Introduction to Oral Presentations: Guest Seminar – Dr. Josh Martin “Effective Presentations for a Scientific Audience”	Article 5 & 6	
13	04/09	Assertion-Evidence Model Presentations Practice Presentations	Robinson Text: make your way through Module 3	PowerPoint Draft
14	04/16	Final Oral Presentations & Faculty Review		
15	04/23	Class Canceled (ASBMB Meeting)		
16	04/30	Final Oral Presentations & Faculty Review		
FINAL	05/07	Final Examination		Research Plan & Reflection Form

*All articles, videos, guidelines, and rubrics posted on Blackboard.

Video #1: Spotting Bullsh*t (<https://www.youtube.com/watch?v=U5PwfU2mWbM>)

Video #2: Four Rules for Calling Bullsh*t (<https://www.youtube.com/watch?v=Eej0k1sUNVo&list=PLPnZfvKID1Sje5jWxt-4CSZD7bUI4gSPS&index=51>)

Video #3: Reductio Ad Absurdum (<https://www.youtube.com/watch?v=lepg5Q4rBAQ>)

Video #4: Debunking Myths (<https://www.youtube.com/watch?v=W3APikrtqqU>)

Video #5: Deploying Null Models and Tracing the Origin of Falsehoods

(<https://www.youtube.com/watch?v=bMblNWhAdso>)

Video #6: Counterexamples and Analogies (<https://www.youtube.com/watch?v=DcfJ2vhZ8rk>)

Video #7: Walk Away (<https://www.youtube.com/watch?v=BjbeitRPR34>)

Article #1: Frei, H., Thurneysen, A. Homeopathy in acute otitis media in children: Treatment effect or spontaneous resolution? *Br. Homeopath J.* **2001**, *90*(4), 180-2.

Article #2: Hoberman, A., *et al.* Treatment of Acute Otitis Media in Children under 2 Years of Age. *N. Engl. J. Med.* **2011**, *364*(2), 105-115.

Article #3: Example Lay Summary *Penetration of Tenofovir and Emtricitabine in Mucosal Tissues: Implications for Prevention of HIV-1 Transmission*

Article #4: Example Research Plan *Truvada® Detection in Urine Samples*

Article #5: Larkin, M. Convey your ideas and enthusiasm – and avoid the pitfalls that put audiences to sleep. Elsevier Publishing Group. <https://www.elsevier.com/connect/how-to-give-a-dynamic-scientific-presentation> (accessed Jan 4, 2017).

Article #6: Example PowerPoint Presentation *Truvada Detection in Urine Samples*