

Science of Contemporary Issues III – 2893

CHEM 1003 Section 3

Spring Quarter, 2023



Welcome to Science of Contemporary Issues III! CHEM 1003 is the third class of a three-quarter sequence focused on real-world applications of chemistry. This quarter will focus on the chemistry of polymers, plastics, drugs, nutrition and chemicals in food. The first quarter focused on sustainability, pollution, and climate change. Last quarter we explored fundamental aspects of non-covalent interactions, nuclear chemistry, redox reactions, and energy storage.

Lecture Instructor: Professor Bryan J. Cowen; **Laboratory Instructor:** Professor Emily Barter

e-mail: bryan.cowen@du.edu

Phone: (303) 871-2559

Office: Seeley G. Mudd, Room 132

Lecture: TR 12:00 p.m. – 1:30 p.m., Sturm Hall 281

Office Hours: By appointment. Please e-mail me at least one day in advance.

Textbook: *Chemistry in Context, Applying Chemistry to Society*, 10th edition by Bradley D. Fahlman, Kathleen L. Purvis-Roberts, et al. (and others) [Required]

Clicker: A Turning Point cloud access subscription is required and available online.

Calculator: A scientific calculator is required for the course.

Canvas: The University of Denver uses Canvas as its learning management system. You may log in to <https://du.instructure.com> with your DU ID number and PioneerWeb password to access the course. Please ensure your settings allow for e-mail announcement notifications. Here are some helpful Canvas resources to get you started:

Canvas Student Quickstart Guide: <http://guides.instructure.com/m/8470>

Canvas Student Guide: <http://guides.instructure.com/m/4212>

Academic Integrity: I have high expectations for each and every one of you as students at the University of Denver. While I encourage group study sessions outside of class, I expect you to work independently during in class examinations. Any deviations from this policy will not be tolerated. For more information, please see the University of Denver's official Honor Code at: <http://www.du.edu/studentlife/studentconduct/>

COVID-19 Protocols: Please use the following link for up-to-date safety protocols (the classroom protocol section is particularly relevant): <https://www.du.edu/coronavirus/operations/protocols>

Science and Engineering Center: Need extra help? The Science and Engineering Learning Center is a collaborative space staffed by undergraduate and graduate learning assistants (LAs) trained to

assist students with some first- and second-year biology, chemistry, physics, computer science and engineering courses. Our goal is to help students grow as problem solvers by assisting with homework sets, lab reports, and preparing for exams. Students can access help by going to <http://portfolio.du.edu/SEC> & viewing the schedule for each discipline.

Welcome to CHEM 1003: Here is a sample of the topics covered throughout this year-long sequence:

Fall – CHEM 1001	Winter – CHEM 1002	Spring – CHEM 1003
• Sustainability	• Purification of Drinking Water	• Plastics
• Air Pollution	• Nuclear Power	• Drugs
• The Ozone Layer	• Nuclear Weapons	• Nutrition
• Climate Change	• Solar Power	• Chemicals in Foods
• Fossil Fuels	• Batteries	• GMOs
• Power Plants	• Alternative Energy Sources	

Student Learning Outcomes (SLOs):

Upon completion of this one-year course sequence, students should become proficient in these areas and/or develop these skills:

Scientific Inquiry – Natural and Physical World SLOs

1. Apply knowledge of scientific practice to evaluate evidence for scientific claims.
2. Demonstrate an understanding of science as an iterative process of knowledge generation with inherent strengths and limitations.
3. Demonstrate skills for using and interpreting qualitative and quantitative information.

Course-Specific SLOs

4. Use graphs to display numerical data and interpret graphical data.
5. When presented with a science-related question, find relevant information to help answer the question.
6. Evaluate sources of information – especially information gleaned from the Internet – to determine their usefulness.
7. Use the skills described above to evaluate scientific claims in the news; learn to identify bogus science and overblown claims.
8. Have the skills and knowledge to make informed choices that impact your health, the environment, and community well-being; view science as a source of power and not fear.
9. Always ask why. Become empowered to take time to do any necessary research to make your own informed decisions; building both confidence and critical thinking skills.

Preliminary Course Schedule – Subject to Change

Week #: Start Date	Topic/Chapter	Assignments
1: 03/27/23	L1: Ch 9.1 – 9.3 L2: Ch 9.4 – 9.5	Syllabus Quiz due Friday, 3/31
No Lab		
2: 04/03/23	L3: Ch 9.6 – 9.7 & 12.4 L4: Ch 9.8 – 9.11	
Lab 1: Polymers! (Meet in BW 015 and remember your safety goggles)		
3: 04/10/23	L5: Finish Ch 9 and Review; Quiz #1 L6: Canvas Reading Assignment (CRA), pages 483 – 484, & Ch 12.3	HW #1 due Friday, 4/14
Lab 2: Synthesis of Aspirin		
4: 04/17/23	Exam #1 – Chapter 9 – Tuesday, April 18 L7: CRA; Activity #1	
Lab 3: Analysis of Aspirin and Other Drugs		
5: 04/24/23	L8: CRA; Activity #2 L9: CRA; Activity #3	HW #2 due Friday, 4/28
Lab 4: Video Project Work and Update TA on Progress		
6: 05/01/23	L10: Ch 11.1 – 11.5 L11: Ch 11.6 – 11.9; Activity #4	
Lab 5: Extracting Fats from Foods		
7: 05/08/23	L12: Ch 11.10 – 11.13 L13: Finish Ch 11 and Review; Quiz #2	HW #3 due Friday, 5/12
Lab 6: Fermentation by Yeast		
8: 05/15/23	Exam #2 – Chapters 10 & 11; CRAs – Tuesday, May 16 L14: CRA & Ch 13.3, 13.6, & 13.8	
Lab 7: The Lactase Enzyme		
9: 05/22/23	L15: Ch 13.4 – 13.5 L16: Finish Course Content; Activity #5	HW #4 due Friday, 5/28
Lab 8: CHEM 1003 Video Project and Screening		
10: 05/29/23	Memorial Day – No Class L17: Final Exam Review; Quiz #3	
No Lab		
06/06/23 (T)	FINAL EXAMINATION 12 – 1:50 pm	

Assignments and Grading:

<u>Category</u>	<u>Points</u>	<u>% of Grade</u>	<u>Additional Info</u>
Exams	375	37.5	2 midterms 1 cumulative final
Lab Assignments	125	12.5	5 labs x 25 points
Video Project (Lab)	65	6.5	See Canvas
Homework	162	16.2	4 HW assignments – variable points 1 syllabus quiz X 12 points
Warm-Up Questions	100	10	Full credit for significant participation Lowest score dropped
Collaborative Quizzes & Activities	100	10	8 assignments, points variable points
In-Class Clicker Questions	73	7.3	Full credit for participation Lowest two scores dropped
Totals	1000	100	

<u>Points</u>	<u>Letter Grade</u>
930 – 1000	A
900 – 929	A–
870 – 899	B+
830 – 869	B
800 – 829	B–
770 – 799	C+
730 – 769	C
700 – 729	C–
670 – 699	D+
630 – 669	D
600 – 629	D–
≤599	F

Grading Notes:

- Final grades will be assigned based on the point scale shown above. The types of assignments and assignment-specific grading procedures are described below.
- When your lowest scores for warm-ups and clickers are dropped, they will appear gray in the Canvas grade book
- When calculating your course grade, pay attention to the number of points in the Canvas grade book, NOT the letter grade calculated by Canvas.

Exams:

- Composed of multiple-choice, fill in the blank, and long-answer questions.
- Bring a *non-phone calculator* and pencil with eraser to all exams.
- Make-up or late exams will not be available.
- Check the final exam schedule now and make sure you do not have any scheduling conflicts.

Lab: See lab syllabus from Prof. Barter

Homework:

- Due 5:00 pm on due date (typically Friday). Late submission (up to seven days) receives maximum 50% credit.
- Composed of assignments that will be posted and submitted through Canvas.
- Graded on correctness with some partial credit.

Warm-Ups:

Before every lecture there will be a short series of questions to answer.

- Due by 7:00 am Tuesdays and Thursdays before each lecture.
- These are graded based on a thoughtful, complete effort, not on correctness. Students typically earn warm-up scores of 100%, as long as they remember to submit the assignments on-time. The two bullet points that follow give an idea of how the grading works:
 - Answers that use evidence to bolster their argument and show an understanding of the reading assignment will receive full credit
 - Answers that rely on direct quotes from the text, are composed of sentence fragments, or are left blank or incomplete will receive a score of zero
- Since warm-ups will be used during class, they may not be turned in late.
- Your lowest warm-up score will be dropped and will not be counted in your final grade.

Collaborative Quizzes and Activities:

- During these in-class quizzes you will have time to compare answers and collaborate with classmates (and Prof. Cowen!) and revise your answers based on your discussions.
- Study for these quizzes! They will give you valuable practice with exam-style questions.

Clickers:

There will be multiple-choice questions during lecture to answer. You do not need a physical clicker but do need a subscription through Turning Technologies. Take note of how the overall class answers each question. It will help all of us notice if/when the class is struggling with a difficult concept.

- Grades are based on participation, not correctness.
- In order to receive clicker points you need to register. Use the link under 'Modules' in Canvas to get started. You only need to complete the registration once.
- Your lowest two scores will be dropped and will not be counted in your final grade.
- In order to receive clicker points you need to register.
- You only need to complete the registration once.
- I will post clicker grades in the grade book throughout the quarter. Check the grade book to make sure that you are getting credit.
- Consult this support page to ensure that you understand how to answer clicker questions:
<https://help.turningtechnologies.com/>