Chemistry 160, 11:00 – 12:15 Tuesday/Thursday 1352 Gilman Hall SYLLABUS

Instructor: Thomas Holme
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Office: 0207 Gilman
Office Hours: (tentative – we can change these if they are not working well for students in the class) Tuesday and Wednesday: 2:00-3:00 (Gilman 0207) and an on-line office hour to be determined. Other times available by appointment.
Chem 177 Chemistry Department Homepage:
https://www.courses.chem.iastate.edu/courses/2023/fall/chem-160
Canvas: https://www.celt.iastate.edu/learning-technologies/canvas-isu/
Top Hat: https://success.tophat.com/s/
Drops and Audits: Students may not register to audit Chem 160 after 5:00 p.m. on Friday, January 22, 2024. The audit does not count towards full-time student status.

Required Textbooks & Supplies: ***Chemistry in Context*** (10th Edition), Fahlman, Purvis-Roberts, Kirk, Kelly, Daubenmire, McGraw-Hill Publishers. This book is part of the **Inclusive Access** program at Iowa State, which means that by enrolling in this course you will have the e-book version included as part of your U-Bill. By using this option you have a much lower price than other textbook options. An inexpensive, non-programmable (no data storage) calculator is required, one with ln x, log x, 10^x, e^x, and y^x functions.

Top Hat Response Technology;

We will occasionally use a response system based on your phone or tablet during lectures. We will be using the Top Hat (www.tophat.com) classroom response system in class. You will be able to submit answers to in-class questions using smartphones, tablets, laptops, or through text messaging. Top Hat is now licensed by the University, so it is not something you have to purchase and we will work through what it looks like and how to access it for class for the first couple of weeks of the course.

Lectures;

TR 11:00 am -12:15 pm in room 1352 Gilman Hall. You are expected to attend classes and to read the text material before lecture. Not everything in the text will be/can be covered in lecture. Bring your smartphone/tablet/laptop to all the lectures. The powerpoint slides to be used in class will be modified slightly and then posted before class. These may be printed out so you have a large fraction of the class powerpoint information in hand and do not need to copy it from the screen during lecture. After class is done, another version of the powerpoint notes will post that includes information covered in class.

In addition, there will be times during the lectures that you will be asked to work with people around you. This is one of the motivations behind meeting in 2354 Gilman, as the movable chairs will make such in-class group work easier to do than in a lecture hall with fixed seating.

Points in the course:

One key, regularly occurring aspect of the course that has 150 points that can be acquired. This tool is the development of Concept Maps.

Concept Maps: We will be connecting chemistry ideas with things we see and hear about in society, so it will be important to identify how those connections work. It can seem complex to keep track of these connections, so we will use concept maps that ultimately build into a tool called the Systems Oriented Concept Map Extension (SOCME) to help with this idea. We will construct concept maps for most, perhaps all, of the chapters we cover this semester. Often this will be done while working in groups during class time. Initially Prof. Holme will provide much of the information and a framework, but as the semester goes on you will be doing more of that component. Points associated with the concept map activities will have 3 components. Up to 80 points will be associated with turning in the concept map you work on in class. 30 points will be associated with homework which will include arriving at class with materials for building concept maps and possibly completed concept maps for the later chapters. 40 points will be associated with the concept map quiz at the end of the semester. We also have the change for our concept maps to be facilitated by a web interface, in addition to using paper/pencil versions. In this sense it will be a type of homework, even with some of the work being done in class. Concept maps are not designed to be done in one, and only one way, so points for concept maps and SOCME diagrams (from in class and as homework) will be oriented towards efforts made more than an emphasis on any certain, expected answer.

Examinations in the course occur twice during the semester, the concept map quiz is the last day of class and the Final Exam occurs during Final Exam week.

Hour Exams: In addition to the Final Exam, there will be two midterm exams during the semester, falling on ***February 20*** and ***March 26*** and one quiz on ***May 2*** that is about how concept maps work, using the last chapter we cover on Nuclear Energy. The first two exams will cover two or three chapters of material in line with the course schedule. The specific topics to be covered will be noted in a study guide made available on the Canvas page initially posted after the class one week before the exam. The format for each exam will be a closed book/closed notes section on factual material and an open NOTES (not book) section where you need to interpret science in the context of the world around us. Anything in your own handwriting counts as open notes for this section. You may take in printouts of the power point notes that you have annotated with your own notes taken in class. Photocopies of pages in the book or other material (including notes from other people in the class) are NOT allowed as open notes. If you take notes on your computer, you will need to print them out to use them in class, we will not be able to allow computers to be open during the open notes portion of the test. Each hour exam is worth 125 points and the concept map quiz is worth 40 points as noted earlier.

For the Concept map quiz to be held on the last day of class you will be given a concept map related to Nuclear Energy, which is our last topic, and asked questions about what the concept map depicts and how it does so. There will also be a question or two asking you to suggest a way that the concept map could be extended from what is present. Details about how this test will work will be provided when we work with concept maps on previous chapters.

RESSURECTION POINTS: One of the key skills that independent learners have is the ability to learn from mistakes. Thus, in this course you are allowed to earn back points you lose on the hour exams

by submitting revisions to your test in the week following when it is held. More detail will be provided about this process at the time of the first exam.

Final Exam:

The Final as scheduled by the Registrar's Office is **Wednesday, May 8, 9:45-11:45 am**

The final exam for this course is entirely open notes and is designed around the core goal of this course, helping students be able to consider scientific information and reason about it. Thus, what will happen is that each student will have an individualized test that is keyed to their own writing assignment (see below). Prof. Holme will read your paper and create a prompt for ChatGPT to write a paper on the same topic. You will receive a printout and your final exam is to use you notes (including any notes you made while working on your paper) and critique what ChatGPT does compared to what you did, and what you know about the topic. Details about what this test will look like will be provided as we get closer to the final exam itself. The final exam is worth 100 points.

Writing Assignment: Communication skills are routinely listed by companies as one of the most important and yet often underdeveloped skills that they seek in new employees. Therefore, Prof. Holme has at least one writing assignment in all of his classes. In this case, the writing assignment will be associated with applying principles we learn in chemistry to problems of sustainability. Considered broadly, *sustainability creates and maintains the conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of* ***present and future generations.*** Science and engineering play an important role in building sustainability, and chemistry in particular provides the ***molecular basis for sustainability***. We will focus on the ways molecular understanding is needed to address sustainability throughout the semester. The writing assignment is worth 100 points.

The writing assignment ***will be relatively brief,*** because Prof. Holme must read them all relatively quickly to grade them before the course finishes. **Therefore, these written assignments may not be any longer than 750 words**. You need to include a bibliography, and those words do not count in the 750-word maximum. An important part of this assignment is deciding on an appropriate topic under the general heading of "global warming or climate change", one that will be capable of being described reasonably in such a short paper. The final draft of the paper is due ***April 4***. For the purpose of the writing assignment we will focus on the chemistry of climate change and its connections to society. We will approach this idea by introducing some aspects of "systems thinking" and identifying how we can think about the increasing impacts of climate change and how they can be understood using chemistry. There is no more specific prompt about what to write so that you can choose an aspect of this broad topic that interests you, but there will be a document posted on canvas that will provide you with information about possible topics underneath the broad category of climate change. There is not a rubric for scoring the paper. You need to write your paper to Dr. Holme, and present a convincing level of detail about your choice of topic that indicates you know what you are writing about and why it's important to know about it. More details and guidelines about the writing assignment will be given in announcements in lecture. Writing assignments are submitted through Canvas and will automatically be checked for plagiarism. Cases of plagiarism are considered a form of academic misconduct.

Grades: Your final grade will be based on a total possible 600 points comprised of two one-hour exams (125 points each – 20.8% each), Concept Maps, SOCMEs and Concept Map quiz (150 points 25.0% total), the writing assignment (100 points – 16.7%) and the final exam (100 points – 16.7%).

Final letter grade will be based on straight percentage noted as total points in the table below. Plus-minus grading will be used for the final grades. Blackboard grade book will be used. Any errors in points or grades posted on the Blackboard grade book should be addressed to Dr. Holme within two weeks from the date posted. It is your responsibility to monitor your score.

The Canvas system is not able to handle some types of points correctly in terms of the "out of" component it shows. You should use this syllabus to tell you the "out of" points, NOT Canvas. (Dr. Holme will do what is possible to make the Canvas information helpful, but the table below is the main way to sort out your grade.)

Grade Score Cutoffs

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
560	540	520	500	480	450	420	390	360	330	300	< 300

Borderline Cases: Participation in classroom group activities can help you if you are on the borderline between grades. As noted in the general description, I collect papers occasionally in class for this purpose. Clicker participation can also factor into this.

TopHat: As noted earlier, we will occasionally use TopHat questions in class to help you think through material that has been presented. These questions are not part of the graded material for the course, but participating with the TopHat questions will help you to learn material that may appear on tests.

Accessibility: Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to work directly with staff in Student Accessibility Services (SAS) to establish eligibility and learn about related processes before accommodations will be identified. After eligibility is established, SAS staff will create and issue a Notification Letter for each course listing approved reasonable accommodations. This document will be made available to the student and instructor either electronically or in hard-copy every semester. Students and instructors are encouraged to review contents of the Notification Letters as early in the semester as possible to identify a specific, timely plan to deliver/receive the indicated accommodations. Reasonable accommodations are not retroactive in nature and are not intended to be an unfair advantage. Additional information or assistance is available online at www.sas.dso.iastate.edu, by contacting SAS staff by email at accessibility@iastate.edu, or by calling 515-294-7220. Student Accessibility Services is a unit in the Dean of Students Office located at 1076 Student Services Building.

Academic Misconduct: The class will follow Iowa State University's policy on academic dishonesty. Anyone suspected of academic dishonesty will be reported to the Dean of Students Office. See the Conduct Code at https://www.policy.iastate.edu/policy/SDR#4.0 for more details and a full explanation of the ISU Academic Misconduct policies. Instances of suspected academic misconduct will be reported to the Dean of Students' office.

Chemistry Help Center: Teaching assistants are available in the ***Martha E. Russell Chemistry Help Center and Resource Room, room 1761 Gilman***. This Center is staffed by general chemistry teaching assistants and is open M – R, 9 – 5, and F, 9 – 1. Answers to all previous quizzes and previous exams are on file in the Center. Resources in the Help Center are not to be removed from the room. For more help, visit Prof. Holme during his office hours.

Free Speech: Iowa State University supports and upholds the First Amendment protection of freedom of speech and the principle of academic freedom in order to foster a learning environment where open inquiry and the vigorous debate of a diversity of ideas are encouraged. Students will not be penalized for the content or viewpoints of their speech as long as student expression in a class context is germane to the subject matter of the class and conveyed in an appropriate manner.

Harassment and Discrimination: Iowa State University does not discriminate on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, gender identity, genetic information, sex, marital status, disability, or status as a U.S. Veteran. Inquiries regarding non-discrimination policies may be directed to Office of Equal Opportunity, 3410 Beardshear Hall, 515 Morrill Road, Ames, Iowa 50011, Tel. 515-294-7612, Hotline 515-294-1222, email eooffice@iastate.edu

Religious Accommodation: Iowa State University welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request the reasonable accommodation for religious practices. In all cases, you must put your request in writing. The instructor will review the situation in an effort to provide a reasonable accommodation when possible to do so without fundamentally altering a course. For students, you should first discuss the conflict and your requested accommodation with your professor at the earliest possible time. You or your instructor may also seek assistance from the Dean of Students Office at 515-294-1020 or the Office of Equal Opportunity at 515-294-7612.

Other things about the course

HOMEWORK: Our textbook has homework problems at the end of each chapter. A number of these end-of-chapter problems will be recommended for you to work. Recommended problems ARE NOT graded, but you can do them to see if you are getting things correct. Correct responses for recommended homework problems will be posted - but not until after you have had some time to work on them. Try not to become dependent on the posted answers.

GOAL: This course is designed to give you a feel for the role that chemistry plays in society. The incorporation of economic, social and political issues into this course is an important part and is a two way street. These other disciplines affect chemistry and chemistry affects them. A reasonably detailed level of understanding of chemical concepts and manipulations will arise from completion of this course. The course emphasizes conceptual understanding of chemical ideas, but will include some mathematics as well, because quantitative reasoning is an important part of how chemistry explains the world around us.

TIPS: For most students, the best way to be more successful in Chem 160 is to come to class ready to participate. This usually means having read the material to be covered in class before you arrive. At the beginning of each class we map out the next 2 or 3 class meetings, so you know in advance how for to read in your book. Many students also benefit a great deal by doing problems, even though there are no points associated with them. If you can do these problems, you can usually do the ones that show up on the open-notes portions of the exams! Finally, it's important to know that there are a number of help resources available to you, so it is important to make use of all the resources (office hours, chemistry help center, practice exams.)

Schedule:
Due Dates and Exam dates are **set.**
Content coverage is **approximate.**

Week	**Chapter / Topics**	**Exams / Assignments**
Jan. 16-19	Intro – *Chapter 1*: Portable electronics	
Jan. 22-26	Electronics – *Chapter 2*: The Air we Breathe	
Jan. 29-Feb 2	The Air we Breathe	
Feb. 5-9	*Chapter 3*: Radiation of the Sun	
Feb. 12-16	Radiation of the Sun	
Feb. 19-23	Radiation of the Sun	**Exam #1, Feb. 20**
Feb. 26 – Mar 1	*Chapter 4*: Chemistry of Climate Change	
Mar. 4-8	Chemistry of Climate Change	
Mar. 11-15	**Spring Break**	
Mar. 18-21	Chemistry of Climate Change	
Mar. 25-29	*Chapter 5*: Water	**Exam #2, Mar 26**
Apr. 1-5	Water	**Paper Due April 4**
Apr. 8-12	Chapter 6: Energy from Combustion	
Apr. 15-19	Energy from Combustion	
Apr. 22-26	*Chapter 7:* Energy Alternatives (Nuclear)	
Apr. 29 – May 3	Nuclear Energy	**Exam #3: May 2** **Concept Map Quiz (Chap 7)**
May 6-10	Finals Week	**Final Exam: May 8, 9:45-11:45 am**