

Winter 2025 Chemistry 222 with Dr. Michael A. Russell

For Section 01, Section H1 and Section W1
CH 222, Mt. Hood Community College, Gresham, Oregon, USA 97030

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Office Hours: Held in AC 2568 MW 10 AM - 11, MW noon - 1 PM and F 8 AM - 9
CH 222 Discord Server: <https://discord.gg/ZhrmjCS>

Chemistry 222 website:

<http://mhchem.org/222>



Required/Recommended Materials:

- * "Chemistry" by The OpenStax College (978-1-947172-62-3),
available here for free: <http://mhchem.org/text/OpenStaxChem.pdf>
- * **Chemistry 222 Companion**, purchase here: <http://mhcc.edu/bookstore> (required)
- * **Scientific calculator** with at least EXP/EE and ln and log (ideally) (required)
- * *iClicker Student App* subscription if attending lectures (optional)

Course Description: This course offers the fundamental basis of chemistry for science, preprofessional, chemistry and engineering majors. This second term covers molecular bonding and properties, gases, liquids, solids, physical states and changes of state, solutions, kinetics, and nuclear chemistry. **Prerequisites:** RD090, WR090 and MTH020, each with a grade of "C" or better, or placement above stated course levels; and CH221 with a grade of "C" or better.

Course Philosophy: To be successful, students enrolled in a 200 level chemistry course should complete all assignments before coming to class, attend classes regularly, participate in discussions, and think critically. Homework assignments represent the *minimum* requirement for understanding the principles of chemistry. It is assumed that A and B students will perform enough *unassigned* exercises to master key concepts. I encourage questions in this class, and I expect a considerable amount of work. If you contact me by email, I will respond to you normally within 24 hours; phone messages will be acted upon as soon as possible.

The Honor Principle: All students will be expected to behave with the highest moral and academic integrity while enrolled in this class. Plagiarism, cheating or sharing information on tests or laboratory reports, disruptive behavior, and other related offenses will be dealt with according to the directives stated in the current *Mt. Hood Community College Student Guide*. Offering, asking for, giving or receiving help from a person or website without instructor consent is cheating. Copying and/or sharing any course materials outside this class is not allowed and illegal due to copyright laws.

Grading:	Midterm Exams (2 total, 130 points each)	260 points	26% of total
	Quizzes (6 total, lowest quiz dropped, 20 points each)	100 points	10%
	Lecture Final Exam	180 points	18%
	Laboratory Final Exam	100 points	10%
	Class Presentation	100 points	10%
	Problem sets, worksheets, reserve CP topic	50 points	5%
	Nine lab experiments (20 points each)	180 points	18%
	Lab Completion Bonus	30 points	3%
	Total points:	1000 points	100%

Tentative grading distribution: A: 90-100% B: 80-89% C: 67-79% D: 57-66% F: less than 57%

Opportunities for extra credit are available and explained in the "Extra-Credit Guide" handout.

Exams and Quizzes will be completed exclusively in class (sections 01 and H1) or exclusively online (section W1.) Sections 01 and H1 must turn in assignments in person to avoid a point penalty. Section W1 assignments must be submitted via email to the instructor in a suitable format, and Section W1 must show work on all problems to get full credit.

Labs and Problem Sets will be submitted on campus (sections 01 and H1) or via email (section W1.) Sections 01 and H1 must be present during recitation for full credit, and a stamp system will be used to guarantee on-time attendance if necessary.

Each student will submit a **Class Presentation** this term - see the "Class Presentation FAQ" for more information.

Details regarding grading will be discussed during the first week of the term.

"What's Due This Week" Schedule for CH 222 Winter 2025

All assignments can be found on our website (<http://mhchem.org/222>)

Assignments are different for section W1 and sections 01 and H1 - contact the instructor if you are unsure which applies to you

- Sections 01 and H1 must bring a printed copy of the lab on the specified day, then turn it in on the deadline during class. Problem sets and labs will be turned in during class in AC 2501; quizzes and exams will be completed during class time. Emailed assignments from Section 01 and H1 students will incur a point penalty, no exceptions.
- Section W1 will email all assignments to the instructor as a single PDF file.

<u>Week</u>	<u>Dates</u>	<u>Lab Assignment</u>
1	1/6 - 1/10	Introduction to the course 01/H1 Lab: "Chromatography" (<u>Lab #1</u>) due next week in recitation W1 Lab: "Introduce Yourself" (<u>Lab #1</u>) due Friday, January 10 by 9 AM via email
2	1/13 - 1/17	Due: <u>Problem set #1</u> Chapter 7; 01, H1: due in recitation;; W1: due 1/15 by 11:59 PM via email Due: <u>Quiz #1</u> ; 01, H1: take in recitation; W1: due 1/17 by 9 AM via email 01/H1 Lab: "Lewis Structures (in class)" (<u>Lab #2</u>) due next week: 01: due in lecture AC 1303 1/22 at 9 AM (MLK day); H1: due 1/22 in recitation W1 Lab: "Lewis Structures (online)" (<u>Lab #2</u>) due Wednesday, January 22 by 11:59 PM
3	1/20 - 1/24	Monday, January 20: MLK day, all classes, office hours canceled, Sec. 01 schedule changes! Due: <u>Problem set #2</u> Chapter 8; 01: due in lecture AC 1303 1/22 at 9 AM (MLK day); H1: due in recitation; W1: due 1/22 by 11:59 PM Due: <u>Quiz #2</u> ; 01: get in lecture AC 1303 1/22, due Friday 1/24 at 9 AM AC 1303 (MLK); H1: take in recitation; W1: due 1/24 by 9 AM H1 Lab: "Valence Bond and Molecular Orbitals (in class)" (<u>Lab #3</u>) due next week in recitation 01/W1 Lab: "Valence Bond and Molecular Orbitals Lab (online)" (<u>Lab #3</u>) 01: due 1/27 in recitation AC 2501 at 1:10 PM (MLK day); W1: due Wednesday, Jan. 29 by 11:59 PM January 24, 9 AM: Last chance to reserve a Class Presentation compound
4	1/27 - 1/31	Due: <u>Problem set #3</u> Chapter 20; 01, H1: due in recitation; W1: due 1/29 by 11:59 PM Due: <u>Quiz #3</u> ; 01, H1: take in recitation; W1: due 1/31 by 9 AM 01/H1 Lab: "Organic Chemistry (in class)" (<u>Lab #4</u>) due next week in recitation W1 Lab: "Organic Chemistry (online)" (<u>Lab #4</u>) due Wednesday, February 5 by 11:59 PM
5	2/3 - 2/7	EXAM #1 (Chapters 7, 8 & 20); 01, H1: take in recitation; W1: due 2/7 by 9 AM Due: "Exam Prep I"; 01, H1: due in recitation; W1: due 2/5 by 11:59 PM 01/H1 Lab: "Molar Mass of a Volatile Liquid (in class)" (<u>Lab #5</u>) due next week in recitation W1 Lab: "Molar Mass of a Volatile Liquid (online)" (<u>Lab #5</u>) due Wednesday, February 12 by 11:59 PM
6	2/10 - 2/14	Due: <u>Problem set #4</u> Chapter 9 & 10; 01, H1: due in recitation; W1: due 2/12 by 11:59 PM Due: <u>Quiz #4</u> ; 01, H1: take in recitation; W1: due 2/14 by 9 AM

Week 6 continued on next page

- 6 *continued* **01/H1 Lab:** "Linear Regression / Structure of Solids (in class)" (Lab #6) *due next week in recitation*
W1 Lab: "Linear Regression / Structure of Solids (online)" (Lab #6) *due Wednesday, February 19 by 11:59 PM*
*Due: **Class Presentation Rough Draft Paper; 01, H1:** due in recitation; **W1:** due 2/12 by 11:59 PM*
- 7 2/17 - 2/21 *Due: Problem set #5 Chapter 10 & 11; ; **01, H1:** due in recitation; **W1:** due 2/19 by 11:59 PM*
*Due: Quiz #5; **01, H1:** take in recitation; **W1:** due 2/21 by 9 AM*
01/H1 Lab: "Molar Mass Determination by Freezing Point Depression (in class)" (Lab #7) *due next week in recitation*
W1 Lab: "Molar Mass Determination by Freezing Point Depression (online)" (Lab #7) *due Wednesday, Feb. 26 by 11:59 PM*
February 21: *Last day to drop or change grade status this quarter at Mt. Hood Community College*
- 8 2/24 - 2/28 **EXAM #2** (Chapters 9-11); **01, H1:** take in recitation; **W1:** due 2/28 by 9 AM
*Due: "Exam Prep II"; **01, H1:** due in recitation; **W1:** due 2/26 by 11:59 PM*
01/H1 Lab: "Kinetics I - The Iodination of Acetone (in class)" (Lab #8) *due next week in recitation*
W1 Lab: "Kinetics I - The Iodination of Acetone (online)" (Lab #8) *due Wednesday, March 5 by 11:59 PM*
- 9 3/3 - 3/7 **CLASS PRESENTATIONS WEEK**
01/H1: *Class Presentation paper due at time of presentation during recitation*
W1: *Class Presentation paper and video due Wednesday, March 5 by 11:59 PM*
- 10 3/10 - 3/14 *Due: Problem set #6 Chapter 12 & 21; **01, H1:** due in recitation; **W1:** due 3/12 by 11:59 PM*
*Due: Quiz #6; **01, H1:** take in recitation; **W1:** due 3/14 by 9 AM*
01/H1 Lab: "Kinetics II - The Iodination of Acetone (in class)" (Lab #9) *due next week Wednesday during Finals*
W1 Lab: "Kinetics II - The Iodination of Acetone (online)" (Lab #9) *due Wednesday, March 12 by 11:59 PM*
All extra credit closes Friday, March 15 at 9 AM
- 11 3/17 - 3/19 **Take Home Lab Final** released by 9 AM Monday, 3/17 for all CH 222 sections. Sections 01 and H1 **must print the Take Home Lab Final and turn it in on Wednesday.**
*Section 01: Take **Lecture Final** tentatively on Wednesday, March 19 at 8:45 AM in AC 1303. Due: **Final Exam Prep** worksheet, **Take Home Lab Final, Kinetics II Lab***
*Section H1: Take **Lecture Final** tentatively on Wednesday, March 19 at 1:10 PM in AC 2501. Due: **Final Exam Prep** worksheet, **Take Home Lab Final, Kinetics II Lab***
*Section W1: Due: **Lecture Final** (available Monday March 17), **Final Exam Prep** worksheet and **Take Home Lab Final** on Wednesday, March 19 by 11:59 PM*

Getting Started in Chemistry 222

Welcome to Chemistry 222! I am glad to have you enrolled in CH 222! Here are some hints on how to get started in the class:

- First, **know that I am here to help you succeed in this class.** If you have any questions, please email me (mike.russell@mhcc.edu) or stop by the Discord server (<https://discord.gg/ZhrmjCS>) during office hours. I try to respond to student inquiries within 24 hours
- There are **three sections of CH 222** this quarter, namely **section 01** (which meets twice a week on campus), **section H1** (which meets only once a week) and **section W1** (which is completely online). Sections 01 and H1 will have similar schedules, but section W1 will exhibit some differences. Your experience in this class will depend on which section you are in, so email the instructor (mike.russell@mhcc.edu) if you have any questions about anything, ok?
- **Purchase the Chemistry 222 Companion from the MHCC Bookstore.** The MHCC Bookstore (<http://mhcc.edu/bookstore>) will ship you a printed copy of this necessary information; alternatively, you can print the document (on our website), but I do not recommend it due to the size of the Companion. You will need access to printed materials this quarter!
- The "**What's Due This Week**" **Schedule for CH 222** located on page 2 of your syllabus **lists all the problem set due dates, assignment deadlines, labs performed, exam/quiz dates, and related information for this term.** You can plan your term by referencing this handout.... follow it closely and you will do well in CH 222!
- **Check your email often during Chemistry 222.** I will be sending weekly reminders as to "what is due this week" in CH 222 as well as returning some assignments, etc. If you would prefer that I use a non-saints email address to communicate with you, let me know - this is easy to set up!
- The **Chemistry 222 website** is worth exploring. The Chemistry 222 website has a host of learning opportunities waiting for you. You can download and/or print copies of the syllabus, lecture notes, labs, quiz answers, and more; plus there are opportunities for extra credit available. To get started, send your web browser to

<http://mhchem.org/222>

You should see the CH 222 website on your screen.

- Check out the **Chemistry 222 Chapter Guides** by selecting "**Chapter Guides**" from the upper left hand corner of the CH 222 website. The Chapter Guides offer a detailed approach for studying the course material through a series of lessons. **Read Lesson Zero**, the "Intro to the Chapter Guides System," to understand how they work.
 - Start thinking about a **Class Presentation Topic**. You will be giving a five minute presentation this term on a **compound**, and you must reserve your compound choice with me. A written paper also accompanies the presentation on your compound. To reserve your compound, email your preferred element choices directly to the instructor, or: <http://mhchem.org/cp222>
- The "**Class Presentations FAQ**" (available in the syllabus or here: <http://mhchem.org/cp222info>) has more information.
- The **Chemistry 222 Textbook** is **free and legal to download** from our website: <http://mhchem.org/text/OpenStaxChem.pdf>
 - Section W1 students: I highly recommend you check out the **CamScanner** app (<http://camscanner.com>) in order to send your work to me as a PDF file over email. CamScanner is free and easy to use.... but there are other options besides CamScanner, use the method best for you. Section 01 and H1 students must submit their work on paper for full credit.
 - Many opportunities for **extra credit** exist in this class.... see the Extra Credit Guide for more information: <http://mhchem.org/xc>
 - You can **download** the entire **Microsoft Office** suite of programs (Word, Excel, PowerPoint, etc.) **for free**... see this link for information: <https://mhcc.edu/OfficeInstall/>
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Again, welcome to Chemistry 222! Let me know if I can make your learning experience better in any way, and I look forward to working with you this term! Peace, Dr. Michael Russell (mike.russell@mhcc.edu, 503.491.7348, AC 2568)

CH 222 CLASS PRESENTATIONS FAQ

FAQ = Frequently Asked Questions

When: Monday March 3 (section 01) or Wednesday March 5 (sections H1 and W1)

What: A chance to share knowledge with your classmates and the MHCC community

Who: *Everyone enrolled in CH 222 (All Sections)*

What topic should I pick? For CH 222, the topic will be **compounds**. Pick a compound you find interesting and write a report on the topic. Since there are millions of compounds, every student must pick a different compound. **Reserve** your compound using the online form at <http://mhchem.org/cp222>

Once your compound has been chosen, begin researching interesting information on the compound using the library, internet, etc. You will be preparing a paper on the compound and presenting your work to the class in a short (five minute) presentation.

If you need to change your class presentation topic after the fourth week of class for any reason you will be penalized 20 points; hence, it's best to reserve a compound early and start researching promptly. Also, if you still have not reserved a compound by the end of the sixth week, you will be penalized 20 points for tardiness.

What should I know when writing the paper? Prepare a paper that is at least **five full pages** of text on your reserved compound. Diagrams, pictures, and other graphics are wonderful, but you will need five full pages of writing for complete credit.

The paper should include a separate **cover sheet** with the title of your presentation and your name. The paper must be neat, typed, referenced, and interesting to read; spelling and grammar will count. The paper must use a "**reasonable**" font and font size (Times New Roman, Arial, etc. with size 12 or less); in addition, use **1" margins or less** (*I will measure!*) and **no more than "one and a half" spaced type** (less than double spaced.) If unsure, ask the instructor.

A separate page with at least eight references will be at the end of your paper. References within the paper and at the end should adhere to the "**Class Presentations Citation Guide**" (*found here:* <http://mhchem.org/cg>) For an *example* paper, see: <http://mhchem.org/expaper>

What is a peer reviewed scientific article? An important aspect of this assignment is to ensure scientific relevancy. To this end, **find two peer reviewed scientific articles published within the last ten years** that include a reference to your compound. **Include the abstracts of these papers with your final Class Presentation paper.**

How do I find my two peer reviewed scientific articles? A sure-fire way to access **peer-reviewed scientific articles** is through the MHCC library's article databases. Go here (<https://libguides.mhcc.edu/chemistryguide> - you may have to enter your MyMHCC username and password if you are off campus). Select **Articles** (on the left), then select **ScienceDirect College Edition** (under "Chemistry Databases") or **Academic Search Complete** (under "General Databases"), then search for your topic. **Remember**, your article citation should include the author(s), year of publication, journal title, title of paper, page number(s), volume of journal, etc. and you will need to include the abstract from the peer reviewed article (but not the entire article!) in your report.

Once you conduct a search for your presentation topic, you will likely have a mix of citation/abstract-only and citation/abstract + full-text (whole article) results. You **only** need the abstract for your paper - do not include the full article. Here is an **example** of a **peer-reviewed scientific paper with an abstract:** <http://mhchem.org/abstr>

Tell me about the Class Presentation Rough Draft Paper During the seventh week, you will be submitting a rough draft of your class presentation paper to the instructor. Ideally this will be the paper in a mostly complete format, but at the very least, two typed pages of text should be submitted.

The rough draft should include at least one peer reviewed scientific paper abstract (with its citation) as well as the **Rough Draft Class Presentation form** (<http://mhchem.org/rd2>) The Class Presentation Rough Draft paper is worth 20 points (out of 100 points total.)

What should I know when preparing for the presentation? You will be creating a five-minute **presentation** on your chosen subject. Sections 01 and H1 will give their presentation during a lab period to their peers; Section W1 will record themselves and upload the video to YouTube for the instructor to view. The presentation must be well prepared and interesting; sloppy preparation shows in the presentation portion. Students can use videos, presentation software (PowerPoint, etc.), posters and chalk to enhance their presentation. Presentation software users will be limited to a maximum of six slides; more invokes a penalty.

Section W1: I encourage students to record themselves on their phone, then upload the video to YouTube, etc.. You can send the link (to an **unlisted** video, not private) to me for watching later. I need to see **you** for 90% or more of the presentation for full credit.

Please note that using your paper (or a *copy* of your paper) during the presentation will result in a ten point penalty. This will prevent you from "reading" your presentation to the audience.

How will I be graded? There are 100 points total for this project. 40 points will reflect the work presented in the paper, 40 points will reflect the work done in the presentation and 20 points will be given for completing the peer review process on time.

In addition, failure to turn in the "Class Presentation Reviewer Guide" to the instructor at the end of the day of presentations will result in a ten-point penalty. You will be completing the Reviewer Guide while others are giving their presentations. If curious, you can view this guide on our website (<http://mhchem.org/cp222info>). *This applies to Sections 01 and H1 only.*

Late class presentations will result in a five-point penalty *per day*. The paper and the presentation must be completed for credit on this assignment. Plagiarism discovered from any source will result in a **total** Class Presentation grade of zero.

A sample **Class Presentation Grading Rubric** is available for viewing on the CH 222 website (<http://mhchem.org/cgr2>) The rubric will allow you to look at the items deemed most important when grading your Class Presentation.

How do I get started? Step 1: Reserve your Class Presentation Compound

Decide on some compounds that interest you, then email the instructor or complete the online web form to reserve your compound: <http://mhchem.org/cp222>

You should receive a response from Dr. Russell within 48 hours after the beginning of the second week of class; if you do not, email him directly at mike.russell@mhcc.edu. Be sure to include alternate compounds in case your first choice has already been claimed; he can also pick one for you if you are uncertain which compound to pick. Reserve your class presentation compound by the end of the third week, **January 24 at 9 AM**. You can see which compounds are still available here: <http://mhchem.org/222av>

Step 2: Turn in the Class Presentation Rough Draft Paper

The Class Presentation Rough Draft paper should include *at least* two typed pages and one peer reviewed scientific article using the handout (<http://mhchem.org/rd2>) at the beginning of your paper. Deadline: **Mon., Feb.. 10 (01)** or **Wed. Feb.. 12 (H1 & W1)**

Step 3: Give the Class Presentation and turn in your final Class Presentation paper

Section 01 and H1: Bring your final Class Presentation paper and give your presentation during lab. **Section 01: Monday, March 3. Section H1: Wednesday, March 5.**

Section W1: At the time of your Class Presentation, turn in your final Class Presentation paper and a video recording of your presentation (YouTube link, etc.) **by Wed., March 5 by 11:59 PM.**

Before you present and submit your paper, check out the reminders contained within the "**Class Presentation 'Last Minute' Checklist**", found here: <http://mhchem.org/cpcs> Note that you must both present your work and submit your paper to receive *any* points on this assignment. All presentations over ten minutes in length and all papers with more than 10 pages of writing will suffer a point penalty.

If you have any questions, see this site (<http://mhchem.org/cp222info>) or contact the instructor.

Name: _____

CH 222 CLASS PRESENTATIONS ROUGH DRAFT PAPER

*Staple this form to the **top** of your Rough Draft Class Presentation Paper for full credit*

Lab Section:

Reserved Compound:

Directions:

- This assignment is worth 20 points out of the 100 points assigned to the Class Presentation assignment.
- *Include* at least two typed pages of your Class Presentation report with this form (more is fine!)
- *Include* at least one abstract from a peer reviewed scientific article with a proper citation included (more is fine!)
- This page should be stapled to the **top** of the other pages in this assignment to avoid a five-point penalty

Helpful Resources:

- The CH 222 Class Presentation Frequently Asked Questions handout: <http://mhchem.org/faq2>
- The CH 222 Citation Guide: <http://mhchem.org/cg>

Class Presentation Rough Draft Paper Due Dates:

- **Section 01:** February 10 at 1:10 PM
- **Section H1:** February 12 at 1:10 PM
- **Section W1:** February 12 at 11:59 PM

Section 01: *The final Class Presentation paper is due at the time of your presentation on Monday, March 3.*

Section H1: *The final Class Presentation paper is due at the time of your presentation on Wednesday, March 5.*

Section W1: *The final Class Presentation paper and recorded presentation will be due by 11:59 PM on Wednesday, March 5.*

Staying Connected in Chemistry 222 This Quarter

Success in Chemistry 222 often depends on staying connected with the flow of the course... here are some suggestions on how to be aware of what is happening each week:

- **Discord** is a wonderful medium for keeping students connected while in this class. Our Discord server will offer weekly assignment updates (with links to labs, problem sets, etc.) as well as links to video lectures, tips and hints from the instructor on how to conquer difficult problems, and more! Joining Discord is easy and free; go here (<https://discord.gg/ZhrmjCS>) and join the CH 222 server to get started.
- I'd be honored if you would subscribe to me on **YouTube!** (<http://youtube.com/marsmars2>) I create videos for more than just chemistry classes... :)

Additional Syllabus Materials for Chemistry 222 Available on the Internet

Some or all of these materials might prove useful to you in our class. All of them are available on the Chemistry 222 website (<https://mhchem.org/222/classroom/ci.htm>).

To access these materials (and more!), go to our website (<http://mhchem.org/222>) and select "**Getting Started**" then "**Other Class Information**" from the upper left corner. Additional materials include:

- The **Extra-Credit Guide** - a helpful guide containing some of the extra credit options available to you in this course
- **Learning Outcomes for CH 222** - a list of "what you will learn" this quarter
- **MHCC College Information** - key information that you, as a student at Mt. Hood Community College, might wish to know, including the **Student Code of Conduct** and **Internet Privacy Policy**
- A **Printable Periodic Table** – this periodic table from ScienceNotes.org will certainly be useful in this course, and you will be able to use this type of periodic table on exams and quizzes.
- The **Chemistry Smiles Generator** – in case you need a smile :) with a chemistry theme.

In addition, the website has a plethora of other "goodies" which may be of assistance to you throughout this quarter... feel free to browse, and if you have questions, please do not hesitate to contact me.

Have a great quarter! Peace,
Michael A. Russell, Ph.D. (he/him/his)
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mhchem.org/222