CHEM 1000: General Chemistry I (Fall 2022)

Course Overview

CHEM 1000 is the first half of a full year course in general chemistry. The second half of the course, CHEM 2000, should ideally be taken within one year of completing CHEM 1000. The goals of these courses are to introduce you to university-level chemistry and to give you an appreciation for the diversity of the field. Learning chemistry is a building process and, in CHEM 1000, we will begin by studying the structure and properties of atoms, the building blocks of matter. We will then study the properties of the different elements – how they are obtained and how they interact. In doing so, we will also learn about molecular structure and geometry, acid-base chemistry, nuclear chemistry, first order kinetics, and applications such as spectroscopy.

Prerequisites

- Chemistry 30 (aka Grade 12 Chemistry) or equivalent
- Math 30-1 (aka Grade 12 Pure Math) or equivalent
- We recommend that students have also taken Math 31 (Calculus) and Grade 12 Physics, where possible.

Covid Policy

- The University of Lethbridge is a mask-friendly environment.

Logistics

- Section A: Tuesday, Thursday and Friday at 12:00-12:50pm in SA8002
- Section B: Tuesday, Thursday and Friday at 2:00-2:50pm in SA8002
- Section C: Tuesday, Thursday and Friday at 1:00-1:50pm in SA8002
- Students in all three sections will write midterms in person on Thursday evenings (see page 3).

Instructor and Contact Information

		email	office	phone	office hours
Course Coordinator	Susan Findlay	susan.lait@uleth.ca	SA 8458	317-5044	open door
Lab Coordinator	Wayne Lippa	lippwk@uleth.ca	SA 8454	329-2043	
Instructor: Sections A & B	Greg Patenaude	greg.patenaude@uleth.ca	SA 8456	329-2310	open door
Instructor: Section C	Ying Zheng	ying.zheng@uleth.ca	SA 8430	317-2813	open door

To avoid missing important announcements, please check your uleth.ca email daily.

To help instructors provide meaningful assistance, please be prepared to show the work that you have done on any question when asking for help. Use of pen and paper (or equivalent) in all your practice work is strongly encouraged!

Online Resources

- http://moodle.uleth.ca has lecture notes and links to many of the resources listed below. It also contains a complete set of CHEM 1000 lecture videos from Fall 2020.
- http://scholar.ulethbridge.ca/susanfindlay/book/chem-1000 has practice questions, practice tests, etc.
- https://campuswire.com/c/GDED68113/feed is a message board for questions, answers, discussions, etc. Access via web browser or the free phone app. We have chosen CampusWire because it allows the option of posting anonymously, and it allows us to type chemical formulas and equations within posts. Whenever possible, posting questions on CampusWire allows the whole class to benefit from your questions (and answers). The more you use it, the more useful it will be!
- https://achieve.macmillanlearning.com/courses/9sthbr is where the weekly online assignments are found.
- https://www.uleth.ca/ross/accommodated-learning-centre/content/exam-accommodations is the website for the University of Lethbridge's Accommodated Learning Centre.

Textbook

- ***Chemistry The Molecular Nature of Matter and Change, Third Canadian Edition*** by Martin S. Silberberg, Patricia Amateis, Rashmi Venkateswaran and Lydia Chen (McGraw-Hill Ryerson)
- Students who wish to succeed in this course will want to have access to a good first year chemistry textbook. We have chosen this text as being a good fit with the course content for CHEM 1000 and 2000, and it is the one for which we provide a reading list (hence its status as "recommended"); however, if you have access to an alternative good first year chemistry textbook, that will be completely fine as long as you are able to use the table of contents and/or index to generate your own reading list.

Topics to Be Covered and Approximate Schedule[§]

Topic		Approx. Week
Chemistry of the Atom: Atomic Structure and Nuclear Chemistry	• Isotopes, their Applications and Mass Spectrometry • Stability of Nuclei • Nuclear Decay and other Nuclear Reactions • First Order Kinetics • Light and Spectroscopy • Orbitals, Electrons and Quantum Numbers • Electron Configurations • Periodic Trends and the Periodic Table	1 – 6
The Chemical Alphabet: Elements of Chemistry	• Chemistry of the Elements (a Survey of the Periodic Table by Group – includes Production, Reactions, Physical and Chemical Properties, etc.) • Lewis Structures, VSEPR and Polarity • Intermolecular Forces, Kinetic Molecular Theory and Gases • Acids and Bases: Arrhenius, Brønsted and Lewis • Aqua Complexes, Acidity and Solubility • Nomenclature and Stoichiometry	6 – 11
Colour in Chemistry: Co-ordination Complexes	• Ligands and Co-ordination Complexes • Crystal Field Splitting • Colour and Spectroscopy	12

[§] We reserve the right to alter this schedule as required. You will be informed of any major deviations.

Grade Composition

	Dates	Method 1	Method 2 [1]
Laboratory	*see laboratory schedule*	25%	25%
Assignments [2]	*due each Tuesday at 11:59 pm* [3]	10%	10%
Midterm Tests [4]	Thurs. Oct. 13th and Thurs. Nov. 17th from 6:30 - 8:00 pm [5]	2 × 15% = 30%	0%
Final Exam [6]	*scheduled by Registrar's Office after Add/Drop deadline*	35%	65%
	Total	100%	100%

YOU MUST PASS BOTH THE LAB (12.5/25) AND LECTURE (37.5/75) SEPARATELY IN ORDER TO PASS THE COURSE.

[1] **As long as the final exam is held in-person**, two methods will be used to calculate your final mark in the course, and you will automatically be assigned the better of the two marks. To qualify for Method 2, you must attempt both midterms. Be aware that it is a very bad plan to neglect preparing for the midterms expecting that you can cram for the final to bring up your mark. Because the concepts build on each other, it is impossible to learn chemistry in a couple of days. **If final exams are moved online, all marks will be calculated using Method 1 only.**

[2] Online assignments are a required course component. To complete these assignments, sign up for CHEM 1000 on Achieve (https://achieve.macmillanlearning.com/courses/9sthbr). The free "grace period" for Achieve lasts until Monday, September 19th. After that, Achieve can be accessed at no cost on desktop computers in the university library and public computer labs. Students who want to access Achieve from elsewhere can do so for a cost of $42US ($64US/2 courses) or by purchasing an access code from the University Bookstore.

[3] The late penalty for online assignment answers submitted after the deadline is 10% per day (assessed on a question-by-question basis). Students who are unable to complete an assignment on time due to illness, family emergency, etc. should email Susan as soon as possible (preferably before the deadline) to arrange for an extension.

[4] Tests will cover all course material including demonstrations, practice problems and assigned readings up to the end of the preceding lecture unless otherwise stated. Failure to attend a test without a valid reason (illness, family emergency, etc.) will result in a score of 0 for that test. If you are excused from a test, your final exam will be pro-rated to reflect the missed test weighting, and you will still be eligible to receive a mark according to Method 2 should it be higher than the modified Method 1 mark.

[5] Midterm tests are scheduled for Thursday evenings. If you have a direct conflict with a test, you must email your class schedule to Susan Findlay at susan.lait@uleth.ca at least one week before the test so that she can arrange for you to write at an alternative time. **Please do NOT skip another class to write a test!**

[6] The final exam for this course is cumulative covering all material presented in lecture, assignments, etc. throughout the semester. The exam will test your comprehension and your ability to problem solve. Only under extraordinary circumstances may students request to write an equivalent invigilated Final Examination at a time and place other than that scheduled. Students must make a written request to the Dean should the need arise.

Academic Integrity

- All students enrolled in this course are expected to behave ethically and act with integrity. **It is your responsibility to behave in the ways that you would want your fellow students to behave.** That is the only way to create an environment that is fair to everyone. Because our students are so important to us, we are passionate about defending your right to a fair learning environment. As such, **any student caught cheating will be reported to the Dean's Office; the minimum penalty will be a grade of 0 on the test or lab report in question or for their overall online assignment mark**. Under the University's Student Discipline Policy, repeated academic offenses trigger progressively more severe forms of discipline over and above those imposed by the instructor.
- In this course, the following behaviours are allowed (and encouraged):
    - Asking your instructor for clarification. You're writing a test and you think the question is missing an essential piece of data. It's completely acceptable to ask your instructor if you're right about that.
    - Studying in groups. Asking and answering each other's questions. Any course-related discussion that you would be comfortable having in front of your instructor.
    - Using CampusWire to ask questions about the assignments/lab/etc. Your instructors aren't going to do your assignment/report for you, but we will certainly help you find your way to the answer.
    - Working on practice questions or online assignments with friends – provided that you are all contributing ideas for the majority of questions. Explaining a concept is actually one of the best ways to solidify your understanding of it. Teaching is a fantastic way to learn!
- In this course, the following behaviours are forbidden:
    - Collaborating on tests. In this course, tests are individual. You may NOT work with others on them.
    - Using any resource not explicitly listed as "allowed" on a test. For example, if we specified that you were allowed to use your textbook, that would NOT permit you to use Google; it would permit you to use your textbook. Google is NOT a textbook. Wikipedia is NOT a textbook.
    - Sharing information about any test you have already written with any other student who has not yet written it. This includes lab quizzes and exams, and it includes ALL methods of communication.
    - Finding a way to access questions (or answers to questions) before you would normally be able to see them is cheating. This includes finding ways to see the answers to assignment questions without having to work through the normal process of figuring out the answers yourself. Doing this also robs you of the learning that is supposed to happen when doing the assignments and tends to result in significantly lower test scores compared to students who do them properly.
    - Copying another student's assignment/lab report/etc. This is very different from "working on online assignments with friends" because, here, the learning is lost and all that's "gained" is an inaccurate mark for the student doing the copying. Please note that, since we have no way of knowing who copied from whom, both students are held equally responsible. ("Working together" should never result in identical answers. "Working together" means discussing concepts and approaches. Students who work together on a lab report should still write the actual lab report independently so that they each express their understanding of the material IN THEIR OWN WORDS.)
    - Submitting work done by somebody else. This is called "contract cheating". It doesn't matter whether the other person is your friend, your roommate, your tutor, a family member or somebody on the internet. It's still cheating if they give you an answer and you copy it. It's still cheating if they give you an answer and you rephrase it.
    - Use of any website that allows students to submit questions to "tutors" who provide worked solutions for a fee. These websites tend to market themselves as "study resources"; they are actually "cheating websites". Given that we'll help you for free with any task on which help is permitted, there is no excuse for ever using any cheating website.

Conversion of Overall Percentage Grade to Letter Grade in CHEM 1000 Fall 2022

The normal overall percentage grade to letter grade conversion will take place according to the following table:

A+	90.00% – 100%
A	85.00% – 89.99%
A-	80.00% – 84.99%
B+	76.67% – 79.99%
B	73.34% – 76.66%
B-	70.00% – 73.33%
C+	66.67% – 69.99%
C	63.34% – 66.66%
C-	60.00% – 63.33%
D+	55.00% – 59.99%
D	50.00% – 54.99%
F	0% – 49.99%

However, it should be noted that the instructor reserves the right to adjust the conversion table when there are multiple students who have overall percentage grades close to one another (*i.e.* when overall percentage grades for students are within 0.33% of each other) and those grades span the intended percentage-to-letter grade cut-off.

For example, if the following overall percentage grades were obtained:

80.97%	78.62%
80.25%	78.45%
80.13%	78.11%
79.89%	
79.75%	

the overall percentage-to-letter grade conversion for the bottom end of A– might be lowered from 80.00% to 79.75%.

Similarly, if the following overall percentage grades were obtained:

71.59%	70.32%
71.28%	70.19%
71.00%	70.01%
	69.73%
	69.55%
	69.42%
	69.16%
	68.91%
	68.65%

the overall percentage-to-letter grade conversion for the bottom end of B– might be raised to 71.00%.

The purpose of maintaining such flexibility in overall percentage grade to letter grade conversion is to provide the instructor with an ability to accommodate for “natural breaks” in overall percentage grade distributions that correspond to a meaningful difference in course performance. In the event that the actual overall percentage grade to letter grade conversion deviates from the provided table, that deviation will be limited to a maximum of +/- 3.00%.

Online Assignments for Chemistry 1000

How to Sign Up for Achieve

1. Go to https://achieve.macmillanlearning.com/courses/9sthbr You will be redirected to a sign-in page.

2. If you already have an account with MacMillan (either from Sapling or Achieve), skip to step 5.

3. Otherwise, click "Create Account" and fill in the form. Please use your preferred names as registered with the UofL so that your instructor can easily find your work. Using your @uleth.ca email address is also best.

4. Check your email (including junk/clutter folders) for a confirmation message. Click on the link provided in the email. You will be redirected back to the sign-in page.

5. Sign in. You will be redirected to Achieve for CHEM 1000. *Fall courses will open on Tuesday, September 6th.*

6. If you have already purchased access to Achieve from the bookstore **and** have followed their instructions* to convert the "bookstore code" into an "Achieve code", enter the "Achieve code" in the box when you are asked to pay. Otherwise, choose "Start a Grace Period". This gives you access to the course for 14 days at no cost.

7. For technical support, visit https://macmillan.force.com/macmillanlearning/s/achieve. For help with the questions, stop by CampusWire. We won't do your assignment for you, but we'll get you on the right track.

* While you can pay directly on the website, the University Bookstore sells cards with Achieve access codes. Since online prices are in US$, this may be a cheaper option. A 6-month code grants access to a single course. A 12-month code grants access to both courses in a paired set (e.g. CHEM 1000 and 2000). **Note that you have to follow the instructions that the bookstore gives you on how to "cash in" the code you buy for one that you can use in Achieve.**

** Students who completed Achieve for CHEM 1000 in a previous semester can contact MacMillan (see step 7) to ask for their payment from that semester to be transferred to this semester. Old grades will NOT be reused; you must do THIS semester's assignments. The purpose of the assignments is for you to practice and master the material.

*** Achieve can be accessed for free on desktop computers in the university library and in IT-managed computer labs.

How to Use Achieve

Once you have registered your account, you can get started using the system. There are TWO assignments due on Tuesday, September 14th at 11:59pm – one to introduce you to the system and one to review math that will be necessary for both lecture and lab. Subsequent assignments will also be due on Tuesday nights (one assignment per week). Each assignment has been calibrated to take approximately an hour for the average student who understood the lectures and has already completed the Exercises posted on the class website. If you tend to work slowly, expect the assignments to take a bit longer than that. They can typically be completed more quickly if you've prepared/studied before starting the assignment.

1. Go to https://achieve.macmillanlearning.com/courses/9sthbr
2. Sign in and click on the assignment you want to work on. This will bring up the first question in the assignment. Questions can be done in any order; use the menu at the left to navigate between them. The menu shows your scores on each question so you can easily see which questions you still need to complete. Achieve won't save answers if you jump from one question to another without clicking "check answer" first. To register your answer, click the "Check Answer" button at the top right. Your work is scored immediately; there is no need to submit the assignment as a whole after you've finished all questions.

New assignments will appear approximately once a week. Unless you are otherwise informed, there is one assignment due every Tuesday night. All assignments are weighted equally, and HW1A/HW1B combine to make one assignment. The late penalty is 10% per day for work submitted after the deadline.

Because HW1A encourages you to enter wrong answers in some places (to show you how the system responds to them), it gives full credit for all questions completed by the student. All other assignments apply just a 5% penalty per incorrect attempt. So, if it takes you five tries to answer a question correctly, you still score 80% on it!

Online Assignment Schedule (Subject to Change)

Assignment	Due Date
HW1A: Practice Assignment	Tues. Sept. 13
HW1B: Math Review Assignment	Tues. Sept. 13
HW2: Atoms, Isotopes and Nuclear Chemistry	Tues. Sept. 20
HW3: Light and the Atom	Tues. Sept. 27
HW4: Electrons, Atomic Orbitals and Quantum Numbers	Tues. Oct. 4
HW5: Electron Configurations and Periodic Trends	Tues. Oct. 11
HW6: Metals of Groups 1 and 2	Tues. Oct. 18
HW7: More Metals and Ionic Solids	Tues. Oct. 25
HW8: Lewis Diagrams and VSEPR	Tues. Nov. 1
Reading Break – No Assignment Due	Tues. Nov. 8
HW9: Polarity, Intermolecular Forces, Kinetic-Molecular Theory and Gases	Tues. Nov. 15
HW10: Nonmetals Part 1 (Hydrogen and Acids)	Tues. Nov. 22
HW11: Nonmetals Part 2 (Groups 14-17 and Boron)	Tues. Nov. 29
HW12: Co-ordination Chemistry and Colour	Tues. Dec. 6

The deadline for all assignments is 11:59pm Mountain time on the date listed.