

Course ID:	Course Title:	Fall 2023
CHE 101	General Chemistry I	Prerequisite: CHEM 30
		Credits: 3

Class Information		Instructor Information		Important Dates	
Delivery:	In-Class	Instructor:	Dr. Kristian Caldo	First Day of Classes:	September 6
Days:	Wed/Fri	Email:	kristian.caldo@ambrose.edu	Last Day to Add/Drop:	September 17
Time:	9:45-11:00 AM	Phone:	(403) 407-9492	Last Day to Withdraw:	November 20
Room:	A2210	Office:	A2156	Last Day to Apply for Extension:	November 23
Lab/Tutorial:	Thilina Jayawardana Ph.D. candidate thilina.jayawardana@ambrose.edu L-1: Mon 2:30-5:30 pm A2141 L-2: Wed 1:00-4:00 pm A2141	Office Hours:	Th: 10:00am-11:00am Wed: 11:00am-12:00 pm Please e-mail me to set an appointment outside office hours.	Last Day of Classes:	December 11
Final Exam:	Wed, 13 Dec 9:00 am – 12:00 nn in A2210				

Important Dates and Information

For a list of all important dates and information regarding participating in classes at Ambrose University, please refer to the Academic Calendar at <https://ambrose.edu/2023-2024-academic-schedule>

Course Description

Focuses on the fundamental principles and concepts necessary for understanding all aspects of chemistry. Topics include atomic and molecular structure, periodicity, bonding, basis of chemical reactions, and intermolecular forces.

Expected Learning Outcomes

1. Generate and analyze valid Lewis structures and resonance structures
2. Build VSEPR diagrams, build line drawings from valid VSEPR diagrams and vice versa. Assign electronic geometry and molecular shapes to atoms, assign approximate bond angles.
3. Recognize and generate constitutional, conformational, geometric and optical isomerism and isomers. Identify functional groups

- Contrast VB and MO Theories, draw the sigma and pi overlaps for a chemical species, name hybridized orbitals and orbital overlaps according to VBT, draw and name the molecular orbitals for bonding and antibonding interactions in MOT.
- Distinguish bond polarities, identify polar and non-polar molecules, identify the intermolecular forces (IMF) present within a collection of chemical species (pure samples and mixtures), use IMF to explain or predict relative boiling points, viscosities, and solubility, use charge separation to rationalize why molecules react at the site of functional groups. Use curly arrows and Lewis diagrams to explain bond breaking and bond making.

Textbooks

- Openstax Chemistry book that can be accessed via <https://www.openstaxcollege.org/textbooks/chemistry> and the Student Solution Manual are also available online.
- It is required to sign up for **Top Hat** in-class response system at <https://app.tophat.com/register/>
 - Course code: 461850
 - Top Hat app is also available for download in your iPhone and Android device.
 - You can access the assigned readings in Openstax Chemistry via Top Hat.
 - For science students, it is recommended to sign up for a 1-year access as you will be using Top Hat in CHE 103 and other BIO courses.

The table below includes the recommended problems from the textbook.

Unit and Book Chapter	Practice Questions
I. Electronic Structure and Periodic Properties of Elements (Chapter 6)	6.1 Electromagnetic Energy (Example 6.1-6.3; 2,4,6,8,12) 6.2 The Bohr Model (17, 30) 6.3 Development of Quantum Theory (31,32, 39, 40-43) 6.4 Electronic Structure of Atoms (54, 56, 57-61, 64) 6.5 Periodic Variations in Element Properties (67-69, 72, 75, 77, 79, 80-82,84)
II. Chemical Bonding and Molecular Geometry (Chapter 7)	7.2 Covalent Bonding (13,14,16,18,20,22) 7.3 Lewis Symbols and Structures (28-33, 39) 7.4 Formal Charges and Resonance (44, 45, 47-52, 54-57, 60, 62) 7.6 Molecular Structure and Polarity (85,86,88,89,91,92,93,94,97,98)
III. Advanced Theories of Covalent Bonding (Chapter 8)	8.1 Valence Bond Theory (Example 8.1; 1,6,8) 8.2 Hybrid Atomic Orbitals (Example 8.2-8.3; 14-16, 18) 8.3 Multiple Bonds (23-25) 8.4 Molecular Orbital Theory (38, 41, 49, 50a-c)
IV. Intermolecular Forces (Chapter 10.1)	10.1 Intermolecular Forces (12,13,18,19,21)
V. Organic Chemistry (Chapter 20)	20 Exercises (1,6,7,9,14,15,16,22,26,29,48,51,54,59,61,62,63)

Course Schedule (Tentative Lecture and Laboratory/Tutorial Schedule)

Week of	Lecture	Activity	Assignments Due on Moodle
9/6	Introduction to the course Chapter 6 Electronic Structure and Periodic Properties of Elements	No Lab	Assignment
9/ 11	Chapter 6 Electronic Structure and Periodic Properties of Elements	Orientation	Assignment 1
9/18	Chapter 6 Electronic Structure and Periodic Properties of Elements	Lab 1: Mass Percent of Acetic Acid	Assignment 2
9/25	Chapter 6 Electronic Structure and Periodic Properties of Elements Sept. 30: National Day for Truth and Reconciliation; No class	Lab 2: Emission Spectra of Elements And Tutorial 1	Assignment 3
10/2	Chapter 7 Chemical Bonding and Molecular Geometry Oct. 4 (W): Deeper Life Conference (no daytime classes)	Lab 3: Determination of Ascorbic Acid Content in Vitamin C Tablet (Mon)	Assignment 4
10/9	Chapter 7 Chemical Bonding and Molecular Geometry Oct. 9 (M): Thanksgiving (no class)	Lab 3: Determination of Ascorbic Acid Content in Vitamin C Tablet (Wed)	Assignment 5
10/16	Chapter 7 Chemical Bonding and Molecular Geometry Term Test 1: Oct. 20	Tutorial 2	
10/23	Chapter 7 Chemical Bonding and Molecular Geometry Chapter 8 Advanced Theories of Covalent Bonding	Lab 4: Recycling a Biodegradable Plastic I And Tutorial 3.1	Assignment 6
10/30	Chapter 8 Advanced Theories of Covalent Bonding	Lab 5: Recycling Biodegradable Plastic II And Tutorial 3.2	Assignment 7
11/6	Nov. 6 – 10: Reading Week; No classes	No Lab	
11/13	Chapter 8 Advanced Theories of Covalent Bonding	Lab 6: Synthesis of Aspirin	
11/20	Chapter 10.1 Intermolecular Forces Term Test 2: Nov. 22	Lab 7: Characterization of Aspirin	
11/27	Chapter 20 Organic Chemistry	Tutorial 4	Assignment 8
12/4	Chapter 20 Organic Chemistry	Tutorial 5	
12/11	Last Day of Classes: Mon, December 11 Final Exam: Dec. 13; 9:00am-12:00 nn in in A2210	No lab	

Prerequisite: CHEM 30

These are the prerequisite topics in the textbook (<https://www.openstaxcollege.org/textbooks/chemistry>). If you need to a refresher on these topics, please go through the suggested chapters and exercises.

Chapter	Practice Questions
Chapter 1 Essential Ideas	1.4 Measurements (Example:1.1 & 1.2) 1.5 Measurement Uncertainty, Accuracy, and Precision (Example: 1.3-1.7) 1.6 Mathematical Treatment of Measurement Results (Example: 1.8-1.12)
Chapter 2 Atoms, Molecules, and Ions	2.6 Molecular and Ionic Compounds (Example: 2.10-2.11)
Chapter 3 Composition of Substances and Solutions	3.1 Formula Mass and the Mole Concept (Example:3.1-3.4, 3.6-3.7) 3.3 Molarity (3.14-3.21) 3.4 Other Units for Solution Concentrations (Examples:3.22-3.25)
Chapter 4 Stoichiometry of Chemical Reactions	4.3 Reaction Stoichiometry (44,46,48,50,57,58) 4.4 Reaction Yields (64, 67, 69, 72, 74,75,76)

Requirements:

WHMIS Quiz

All students registered in CHE 101 are expected to take the *WHMIS 2015* quiz and pass with a percentage of at least 80 before engaging in lab activities. Students who have not passed a version of this quiz by the time of their first lab will not be allowed to participate in the lab activity and will take a zero for anything from that marked lab. Students need to complete the quiz by **Sunday, September 10**. Here is the link to the Moodle site: <https://moodle.ambrose.edu/course/view.php?id=2576>

Labs

- Labs are mandatory. You must provide a doctor's note if you need to miss one for health reasons. A mark of less than 50% in the laboratory component and/or on the weighted average of the midterm and final examinations will result in a final grade of no greater than D. Completion and submission of reports for fewer than three laboratory experiments will result in a final grade of no greater than D. A grade of D does not satisfy the prerequisite requirements for further chemistry courses or admission to programs in Biology.
- Pre-lab quizzes will help you to perform the necessary calculations to make the lab quicker and easier. Pre-lab quizzes will be available on Moodle for you to print and make a copy of it. Complete it and hand it to the Lab Instructor before the start of each lab.
- Students wearing inappropriate laboratory attire or incomplete pre-laboratory assignments will not be permitted to conduct experiments for safety reasons.

- You must have a laboratory notebook. Include everything in your notebook. Write legibly in pen (no erasing or white-out). Draw a line through any mistakes; do not scribble them out. At the top of each page, write the date and title of the experiment.
- You will have five labs to perform; three of them require filling in worksheets and two to submit formal lab reports. Worksheets are due at the end of the lab. Formal lab reports are due next week at the beginning of the tutorial. Each lab is out of 20 marks. Each worksheet or lab reports are worth 15 marks. Pre-lab quizzes for each lab count to 5 marks. The use of artificial intelligence software for writing formal reports is prohibited and is considered an academic misconduct.
- The grade for each experiment will be based on your pre-laboratory assignment, maintaining a lab notebook, your performance in the laboratory, and the required experimental report or worksheet.

Tutorials

Tutorials are held during lab class. Tutorials are opportunities to apply lessons learned in the lecture on answering sample problems and assignments. Quizzes will also be administered during tutorials.

Exams

Examinations are a combination of multiple-choice and written answer questions. Students can only bring pencils, pens, erasers, model kits, ID cards, and non-programmable calculators during exams. The final exam is cumulative.

Other Important requirements

- You cannot use your phone as your calculator; you must use a calculator to do all your work.
- In respect to the professor and to your fellow students, we ask that you:
 - a) Turn your phone off during class and that you do not use it for texting during lecture or lab;
 - b) Not have conversations with the people beside you during lecture – it is very distracting to the people around you;
 - c) Use your laptops for lecture material and assignments only – that you are not using the internet or social media during class time;
 - d) Arrive to lecture, lab and tutorial on time; you will not be permitted in the lab if you miss the pre-lab talk (the first 20 minutes of the lab);
 - e) Don't listen to music in class or lab. These will help to maximize the learning experience for you and your fellow students.

Attendance:

Class participation is crucial to your learning in this course. Therefore, if you miss any class, please make sure to complete the notes from your peers.

Grading Assessments:

In determining the overall grade in the course, the following weights will be used:

Laboratory Experiments Prelab quiz and tutorial quiz (10%) Lab notebook (5%) Worksheet/Reports (10%)	25%
Moodle Assignments and In-class Top Hat Questions	15%
Term Test 1	15%
Term test 2	15%
Final Examination	30%

Grade Summary:

The available letters for course grades are as follows:

Grade	Interpretation	Grade Points
A+	Excellent	4.00
A		4.00
A-		3.70
B+	Good	3.30
B		3.00
B-		2.70
C+	Satisfactory	2.30
C		2.00
C-		1.70
D+	Poor	1.30
D		1.0
F	Failure	0.00
P	Pass	No Grade Points

A+	A	A-	B+	B	B-
95% - 100%	87% - 94.99%	82% - 86.99%	77% - 81.99%	72% - 76.99%	66% - 71.99%

C+	C	C-	D+	D	F
62% - 65.99%	58% - 61.99%	54% - 57.99%	50% - 53.99%	45% - 49.99%	< 44.99%

Because of the nature of the Alpha 4.00 system, there can be no uniform University-wide conversion scale. The relationship between raw scores (e.g. percentages) and the resultant letter grade will depend on the nature of the course and the instructor's assessment of the level of each class, compared to similar classes taught previously.

Please note that final grades will be available on student registration system. Printed grade sheets are not mailed out.

Ambrose University Important Information:

Ambrose University Important Policies & Procedures:

Registration

Registration is the process of selecting and enrolling in classes for upcoming semesters. Only students who are registered will be permitted to attend class and receive a grade for the course. You are responsible for ensuring that the courses you take are appropriate for your program, that they do not have any scheduling conflicts, that they have the necessary prerequisites and that they meet all degree requirements.

Withdrawal From A Course

Prior to the Add/Drop deadline: through the student registration system whereby course(s) will be removed with no academic or financial penalty. After the Add/Drop deadline and until the Withdrawal deadline: through submission of the 'Withdrawal from Course' form whereby course(s) will remain on the permanent academic record/transcript with the symbol 'W'. (See ambrose.edu/registrar/request-forms.) Students who withdraw from more than 30 credits attempted at Ambrose University will be required to withdraw from their program. Students considering withdrawing from courses are encouraged to discuss with their Faculty Advisor and/or the Office of the Registrar questions relating to their withdrawal decision specifically relating to financial assistance, study permit requirements, prerequisites for subsequent courses, readmission, and/or graduation timeline. Students who do not formally withdraw from a course are still considered registered in the course, even if they are no longer attending classes. In this case, students will be assigned a grade based on coursework completed as per the course syllabus and are responsible to pay the tuition and fees assessed for the course. Under extenuating circumstances, students may request from the Office of the Registrar a course(s) withdrawal after the Withdrawal deadline and until the last day of classes. Extenuating circumstances typically consider situations such as medical emergencies, compassionate grounds, or unforeseen conditions/situations beyond the students' control that arise after the start of the semester and are considered on a case-by-case basis. Supporting documentation from a physician or Registered Health Professional must accompany this request.

Coursework Extensions

Should a request for a time extension on coursework exceed the end of the term, a *Coursework Extension Application* must be completed and submitted to the Office of the Registrar. The extension (if granted) will be recorded on the student record. Extensions are granted at the discretion of the instructor and registrar. If granted, time extensions do not excuse you from a final examination where one has been scheduled for the course. More conditions apply.

Exam Scheduling

Students who find a conflict in their exam schedule must submit a *Revised Final Exam Time Application* to the Office of the Registrar by the deadline noted in the Academic Calendar. Requests will be considered for the following reasons only: 1) the scheduled final examination slot conflicts with another exam; or 2) the scheduled

final examination slot results in three consecutive examination periods. Travel is not considered a valid excuse for re-scheduling or missing a final exam.

Communication

Your Ambrose email account is the University's primary and official mode of communication with you. Information delivered to your Ambrose email is considered official notification. Ambrose University is not responsible for your failure to receive important information delivered to your Ambrose email.

Lecture Recording

The recording of lectures or any other classroom academic activity, other than an audio recording as an accommodation, is prohibited except at the discretion of the instructor. Any use other than that agreed upon with the instructor constitutes academic misconduct and may result in suspension or expulsion. Permission to allow a lecture recording is not a transfer of any copyrights, so such recordings may be used only for individual or group study with other students enrolled in the same class and may not be reproduced, transferred, distributed or displayed in any public or commercial manner. Student must destroy recordings in any, and all formats at the end of the semester in which they are enrolled in the class. All students recording lectures, must sign the Permission Form to audio record lectures which is available through the Office of the Registrar.

Standards of Behaviour in the Classroom Setting

Learning is an active and interactive process, a joint venture between student and instructor and between student and student. Some topics covered within a class may lead to strong reactions and opinions. It is important that Students understand that they are entitled to hold contradictory beliefs and that they should be encouraged to engage with these topics in a critical manner. Committing to this type of "active learning" significantly increases the learning experience for both teacher and student, and reflects the Christian imperative to pursue truth, which lies at the heart of the Ambrose educational experience. However, active discussion of controversial topics will be undertaken with respect and empathy, which are the foundations of civil discourse in the Classroom Setting. Primary responsibility for managing the classroom rests with the instructor. The instructor may direct a student to leave the class if the student engages in any behaviour that disrupts the classroom setting. If necessary, Ambrose security will be contacted to escort the student from class.

Academic Integrity

We are committed to fostering personal integrity and will not overlook breaches of integrity such as plagiarism and cheating. Academic dishonesty is taken seriously at Ambrose University as it undermines our academic standards and affects the integrity of each member of our learning community. Any attempt to obtain credit for academic work through fraudulent, deceptive, or dishonest means is academic dishonesty. Plagiarism involves presenting someone else's

ideas, words, or work as one's own. Plagiarism is fraud and theft, but plagiarism can also occur by accident when a student fails or forgets to acknowledge to another person's ideas or words. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or immediate dismissal from the university. Students are expected to be familiar with the policies in the current Academic Calendar that deal with plagiarism, cheating, and the penalties and procedures for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean and become part of the student's permanent record.

Academic Policies

It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Academic Calendar. The academic calendar can be found at <https://ambrose.edu/academics/academic-calendar>

Privacy

Personal information (information about an individual that may be used to identify that individual) may be required as part of taking this class. Any information collected will only be used and disclosed for the purpose for which the collection was intended. For further information contact the Privacy Compliance Officer at privacy@ambrose.edu.

Academic Success and Supports

Accessibility Services

Academic accommodation is provided to Ambrose students with disabilities in accordance with the Alberta Human Rights Act and the Canadian Charter of Rights and Freedoms. Provision of academic accommodation does not lower the academic standards of the university nor remove the need for evaluation and the need to meet essential learning outcomes. Reasonable accommodations are tailored to the individual student, are flexible, and are determined by considering the barriers within the unique environment of a postsecondary institution. It can take time to organize academic accommodations and funding for disability-related services. Students with a disability who wish to have an academic accommodation are encouraged to contact Accessibility Services as early as possible to ensure appropriate planning for any needs that may include accommodations. Staff can then meet with students to determine areas to facilitate success, and if accommodations are required, ensure those accommodations are put in place by working with faculty.

Learning Services

Learning Services provides support with

- **research and communication skills** (e.g., writing a paper, researching, giving a presentation), and
- **subject-specific skills** (e.g., solving a chemistry problem, reconciling a general ledger, understanding a philosophical argument).

We offer workshops, one-to-one tutoring, and more, and all of our services are **free** to students currently enrolled at Ambrose University. To learn more, please visit <https://ambrose.edu/sas/learning-services>.

Mental Health Support

All of us need a support system. We encourage students to build mental health supports and to reach out when help is needed.

On Campus:

- Counselling Services: ambrose.edu/counselling
- For immediate crisis support, there are staff on campus who are trained in Suicide Intervention Skills and can help you access mental health support. See <https://ambrose.edu/student-life/crisissupport> for a list of staff members.
- For additional wellness resources go to the Ambrose wellness page: <https://ambrose.edu/wellness>

Off Campus:

- Distress Centre - 403-266-4357
- Alberta Mental Health Helpline - 1-877-303-2642 (Toll free)
- Sheldon Chumir Health Care Centre - 403-955-6200
- Emergency - 911

Sexual Violence Support

We are committed to supporting students who have experienced gender based sexual violence in the past or while at Ambrose. Many of the staff, faculty, and student leaders have received Sexual Violence Response to Disclosure training. We will support you and help you find the resources you need and you can access information about reporting. Information about the Sexual Violence policy and on and off campus supports can be found on our website— ambrose.edu/sexual-violence-response-and-awareness.

Off Campus:

- Alberta's Oneline for Sexual Violence - 1-866-403-8000 call or text
- Clinic: Sheldon Chumir Health Centre - 403-955-6200
- Calgary Communities Against Sexual Abuse - 403-237-5888
- Chat: www.calgarycasa.com

Note: Students are strongly advised to retain this syllabus for their records.