

<b>Course ID:</b>	<b>Course Title:</b>	<b>Fall 2022</b>
<b>CHE 101</b>	<b>General Chemistry I</b>	<b>Prerequisite: CHEM 30</b>
		<b>Credits: 3</b>

Class Information		Instructor Information		Important Dates	
<b>Delivery:</b>	In-Class	<b>Instructor:</b>	Kristian Caldo Ph.D. (Lecture and lab)	<b>First Day of Classes:</b>	September 7, 2022
<b>Days:</b>	W/F	<b>Email:</b>	kristian.caldo@ambrose.edu	<b>Last Day to Add/Drop:</b>	September 18, 2022
<b>Time:</b>	8:15-9:30 AM	<b>Phone:</b>		<b>Last Day to Withdraw:</b>	November 21, 2022
<b>Room:</b>	A2131	<b>Office:</b>	A2156	<b>Last Day to Apply for Extension:</b>	November 23, 2022
<b>Lab/ Tutorial:</b>	M: 8:15am to 11:15 am W: 1:00-4:00 pm A2141	<b>Office Hours:</b>	TTh; 3 pm to 5 pm Please e.mail me to make an appointment.	<b>Last Day of Classes:</b>	December 12, 2022 (Dec 9 for CHE 101)
<b>Final Exam:</b>	Wed, 14 Dec 2022 9:00 am – 12:00 nn in A2131				

### 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/undergrad-academic-calendar/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
4. 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.

5. 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

<https://www.openstaxcollege.org/textbooks/chemistry> and the Student Solution Manual are available online.

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 <a href="#">Electromagnetic Energy</a> (Example 6.1-6.3; 2,4,6,8,12) 6.2 <a href="#">The Bohr Model</a> (17, 30) 6.3 <a href="#">Development of Quantum Theory</a> (31,32, 39, 40-43) 6.4 <a href="#">Electronic Structure of Atoms</a> (54, 56, 57-61, 64) 6.5 <a href="#">Periodic Variations in Element Properties</a> (67-69, 72, 75, 77, 79, 80-82,84)
II. Chemical Bonding and Molecular Geometry (Chapter 7)	7.2 <a href="#">Covalent Bonding</a> (13,14,16,18,20,22) 7.3 <a href="#">Lewis Symbols and Structures</a> (28-33, 39) 7.4 <a href="#">Formal Charges and Resonance</a> (44, 45, 47-52, 54-57, 60, 62) 7.6 <a href="#">Molecular Structure and Polarity</a> (85,86,88,89,91,92,93,94,97,98)
III. Advanced Theories of Covalent Bonding (Chapter 8)	8.1 <a href="#">Valence Bond Theory</a> (Example 8.1; 1,6,8) 8.2 <a href="#">Hybrid Atomic Orbitals</a> (Example 8.2-8.3; 14-16, 18) 8.3 <a href="#">Multiple Bonds</a> (23-25) 8.4 <a href="#">Molecular Orbital Theory</a> (38, 41, 49, 50a-c)
IV. Intermolecular Forces (Chapter 10.1)	<a href="#">10.1 Intermolecular Forces</a> (12,13,18,19,21)
V. Organic Chemistry (Chapter 20)	20 <a href="#">Exercises</a> (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
9/7	Introduction to the course Chapter 6 Electronic Structure and Periodic Properties of Elements	No Lab; Perform prelab activities.	
9/12	Chapter 6 Electronic Structure and Periodic Properties of Elements	Lab 1: Mass Percent of Acetic Acid	Assignment 1 Due: Sept. 17; 8pm
9/19	Chapter 6 Electronic Structure and Periodic Properties of Elements	Tutorial	
9/26	Chapter 6 Electronic Structure and Periodic Properties of Elements  Sept. 30: National Day for Truth and Reconciliation; No class	Lab 2: Determination of Ascorbic Acid Content in Vitamin C Tablet	Assignments 2 Oct. 1; 8pm
10/3	Chapter 7 Chemical Bonding and Molecular Geometry  Oct. 5: Deeper Life Conference (no daytime classes)	No Lab	
10/10	Chapter 7 Chemical Bonding and Molecular Geometry  Oct. 10: Thanksgiving; No class	No Lab	Assignment 3 Oct. 14; 8pm
10/17	Chapter 7 Chemical Bonding and Molecular Geometry  Term Test 1: Oct. 19	Lab 3: Recycling Polylactic Acid	
10/24	Chapter 8 Advanced Theories of Covalent Bonding	Lab 4: Recycling Polylactic Acid	Assignment 4 Oct. 29; 8pm
10/31	Chapter 8 Advanced Theories of Covalent Bonding	Tutorial	
11/7	Nov. 7 – 12: Reading Week; No classes	No Lab	
11/14	Chapter 10.1 Intermolecular Forces	Tutorial	
11/21	Chapter 10.1 Intermolecular Forces  Term Test 2: Nov. 23	Lab 5: Synthesis of Aspirin	
11/28	Chapter 20 Organic Chemistry	Tutorial	
12/5	Chapter 20 Organic Chemistry	Tutorial	Assignment 5 Dec. 3; 8:00 pm
12/12	Last Day of Classes: Mon, December 12  Final Exam: W Dec. 14; 9:00-12:00 in in A2131		

## 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 <a href="#">Measurements</a> (Example:1.1 & 1.2) 1.5 <a href="#">Measurement Uncertainty, Accuracy, and Precision</a> (Example: 1.3-1.7) 1.6 <a href="#">Mathematical Treatment of Measurement Results</a> (Example: 1.8-1.12)
Chapter 2 Atoms, Molecules, and Ions	2.6 <a href="#">Molecular and Ionic Compounds</a> (Example: 2.10-2.11)
Chapter 3 Composition of Substances and Solutions	3.1 <a href="#">Formula Mass and the Mole Concept</a> (Example:3.1-3.4, 3.6-3.7) 3.3 <a href="#">Molarity</a> (3.14-3.21) 3.4 <a href="#">Other Units for Solution Concentrations</a> (Examples:3.22-3.25)
Chapter 4 Stoichiometry of Chemical Reactions	4.3 <a href="#">Reaction Stoichiometry</a> (44,46,48,50,57,58) 4.4 <a href="#">Reaction Yields</a> (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 11**. 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 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	25%
Assignments/Quizzes	10%
Term Test 1	15%
Term test 2	15%
Final Examination	35%

### 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	Minimal Pass	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:

### Communication

All students have received an Ambrose e-mail account upon registration. It is the student's responsibility to check this account regularly as the Ambrose email system will be the professor's instrument for notifying students of important matters (cancelled class sessions, extensions, requested appointments, etc.) between class sessions.

### Exam Scheduling

Students who find a conflict in their exam schedule must submit a Revised Examination Request form to the Registrar's Office by the deadline date; please consult the Academic Calendar. Requests will be considered for the following reasons only: 1) the scheduled final examination slot conflicts with another exam; 2) the student has three final exams within three consecutive exam time blocks; 3) the scheduled final exam slot conflicts with an exam at another institution; 4) extenuating circumstances. Travel is not considered a valid excuse for re-scheduling or missing a final exam.

### 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. Please refer to your professor regarding their electronic etiquette expectations.

### 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/content/academic-calendar-2>.

### 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](mailto:privacy@ambrose.edu).

### 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 are normally granted for 30 days beyond the last day of the term.

Normally, Course Extension Applications will be considered only when all of the following conditions are met:

- the quality of prior course work has been satisfactory;
- circumstances beyond your control, such as an extended illness or death of a family member, make it impossible for you to complete the course work on time; and
- you submit *Coursework Extension Application* to the Office of the Registrar on or before the deadline specified in the Academic Schedule.

If granted, time extensions do not excuse you from a final examination where one has been scheduled for the course.

A temporary grade of TX will be assigned until a final grade is submitted in accordance with the new deadline. A final grade of F will apply to:

- all course work submitted after the end of the semester unless a coursework extension has been granted; and all course work submitted after the revised due date provided by an approved extension to coursework.

## 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.

### **Ambrose Writing Services**

Ambrose Writing services provides academic support in the four foundational literacy skills—listening, speaking, reading, and writing. It also assists students with critical thinking and the research process. Throughout the academic year, students can meet with a writing tutor for personalized support, or they can attend a variety of workshops offered by Academic Success. These services are free to students enrolled at Ambrose University. Academic Success serves all students in all disciplines and at all levels, from history to biology and from theatre to theology. To learn more, please visit <https://ambrose.edu/writingcentre>

### **Ambrose Tutoring Services**

Ambrose Tutoring Services provides support in specific disciplinary knowledge, especially in high-demand areas such as chemistry, philosophy, math and statistics, and religious studies. These tutors also coach students in general study skills, including listening and note-taking. During the academic year, Ambrose Tutoring Services offers drop-in tutoring for courses with high demand; for other courses, students can book a one-to-one appointment with a tutor in their discipline. These services are free to students enrolled at Ambrose University. To learn more, please visit <https://ambrose.edu/tutoring>.

### **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](https://ambrose.edu/counselling)
- Peer Supportive Listening: One-to-one support in Student Life office. Hours posted at [ambrose.edu/wellness](https://ambrose.edu/wellness).
- For immediate crisis support, there are staff on campus who are trained in Suicide Intervention and Mental Health First Aid. See [ambrose.edu/crisissupport](https://ambrose.edu/crisissupport) for a list of staff members.

#### Off Campus:

- Distress Centre - 403-266-4357
- Sheldon Chumir Health Care Centre - 403-955-6200
- Emergency - 911

### **Sexual Violence Support**

All staff, faculty, and Residence student leaders have received *Sexual Violence Response to Disclosure* training. We will support you and help you find the resources you need. There is a website with on and off campus supports – [ambrose.edu/sexual-violence-response-and-awareness](https://ambrose.edu/sexual-violence-response-and-awareness).

#### Off Campus:

- Clinic: Sheldon Chumir Health Centre - 403-955-6200
- Calgary Communities Against Sexual Abuse - 403-237-5888

<b>Note:</b> Students are strongly advised to retain this syllabus for their records.
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