

Course ID:	Course Title:	Fall 2021
CHE 101	General Chemistry I	Prerequisite: CHEM 30
		Credits: 3

Class Information		Instructor Information		Important Dates	
Delivery:	In-Class	Instructor:	Liza Abraham Ph.D (Lecture) Jennifer Neufeld MSc (Lab)	First Day of Classes:	September 8, 2021
Days:	W/F	Email:	labraham@ambrose.edu Jennifer.Neufeld@ambrose.edu	Last Day to Add/Drop:	September 19, 2021
Time:	10:00-11:15 AM	Phone:	(403) 410-2000 ext. 6921	Last Day to Withdraw:	November 22, 2021
Room:	A 2131	Office:	A2160	Last Day to Apply for Extension:	November 23, 2021
Lab/ Tutorial:	M: 12:00-3:00 pm W: 3:45-6:45 pm	Office Hours:	Open-door policy; you can also e.mail me to make an appointment.	Last Day of Classes:	December 13, 2021
Final Exam:	Final Exam: W Dec. 15; 9:00-12:00 in 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/academic-calendar> .

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, 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.

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)
Chapter 6 Electronic Structure and Periodic Properties of Elements	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)
Chapter 7 Chemical Bonding and Molecular Geometry	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)
Chapter 8 Advanced Theories of Covalent Bonding	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)
Chapter 10.1 Intermolecular Forces	10.1 Intermolecular Forces (12,13,18,19,21)
Chapter 20 Organic Chemistry	20 Exercises (1,6,7,9,14,15,16,22,26,29,48,51,54,59,61,62,63)

Course Schedule

(Tentative Lecture / Tutorial / Laboratory Schedule)

Week of	Lecture	Tutorial	Lab	Assignments
9/6	Introduction to the course Chapter 6 Electronic Structure and Periodic Properties of Elements	No tutorial	No Lab	
9/13	Chapter 6 Electronic Structure and Periodic Properties of Elements	No Tutorial	Lab 1: Mass percent of Acetic Acid	September 15: Assignment 1
9/20	Chapter 6 Electronic Structure and Periodic Properties of Elements	No Tutorial	Lab 2: Determination of Ascorbic Acid Content in Vitamin C Tablet	
9/27	Chapter 7 Chemical Bonding and Molecular Geometry	No Tutorial	Lab 3: Recycling Polylactic Acid	September 29: Assignments 2 due in class
10/4	Chapter 7 Chemical Bonding and Molecular Geometry Deeper Life Conference (October 6 no daytime classes)	No Tutorial	No Lab	
10/11	Chapter 7 Chemical Bonding and Molecular Geometry October 11 Thanksgiving: No class	No Tutorial	No Lab	October 13: Assignment 3 due in class
10/18	Chapter 7 Chemical Bonding and Molecular Geometry Term Test 1: October 20	No Tutorial	Lab 4: Recycling Polylactic Acid	
10/25	Chapter 8 Advanced Theories of Covalent Bonding	No Tutorial	Lab 5: Synthesis of Aspirin	October 27: Assignment 4 due in class
11/1	Chapter 8 Advanced Theories of Covalent Bonding	Tutorial 1 Quiz 1	No Lab	
11/8	Chapter 8 Advanced Theories of Covalent Bonding Reading Week: November 8 – 13; no classes)	No Tutorial	No Lab	
11/15	Chapter 10.1 Intermolecular Forces	Tutorial 2 Quiz 2	No Lab	
11/22	Chapter 10.1 Intermolecular Forces Term Test 2: November 24	Tutorial 3 Quiz 3	No Lab	
11/29	Chapter 20 Organic Chemistry	Tutorial 4 Quiz 4	No Lab	

12/6	Chapter 20 Organic Chemistry	Tutorial 5 Quiz 5	No Lab	December 8: Assignment 5 Due in Class
12/13	Last Day of Classes: Mon, December 13 Final Exam: W Dec. 15; 9:00-12:00 in in A2131			

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 partake in the lab activity and will take a zero for anything from that marked lab. Students need to complete the quiz by **Sunday, September 12**. Here is the link to the Moodle site: <https://moodle.ambrose.edu/course/view.php?id=2576>

Review of High School Chemistry

Chapters 1 to 4 review high school material and, therefore, are expected prerequisite material. To help you with the review, textbook practice questions are provided along with two assignments.

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

Labs and tutorials alternate between weeks. Tutorials are opportunities to work in groups and learn how to take good notes. In addition, you will have several opportunities for formal feedback on your progress throughout the term. Students work collaboratively in groups of 3 or 4 on a series of problems before writing an individual quiz during each tutorial.

Assignments

There are five assignments in this course. The first two assignments are based on the review of high school chemistry. The fifth assignment will be applying many of the CHE 101 concepts you have learned in the course into the structure of Paclitaxel, a naturally derived cancer drug. The first four assignments are individual work. The fifth assignment provides you with the opportunity to work in groups on an inquiry-based worksheet where you will be applied and extend all the core concepts in the context of real-life applications. Assignments will be collected as hard copies in class. improved understanding of the concepts learned in the course. You will lose **10% a day for late submission; no submission after five days, including weekends.**

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 Instagram 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%
Tutorial Quizzes (5 of them)	10%
Assignments	10%
Term Test 1	15%
Term test 2	15%
Final Examination	25%

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.

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
- Peer Supportive Listening: One-to-one support in Student Life office. Hours posted at 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 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.

Off Campus:

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

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