Course Outline

University Studies

Winter, 2019

CHEM 261A: ORGANIC CHEMISTRY I

3 credits, 3 hours lecture per week, 3 hours laboratory per week

Organic Chemistry I introduces the correlation of structure and chemical bonding in carbon compounds with the physical properties and chemical reactivity of organic molecules. With discussion based on selected functional groups, the course will introduce stereochemistry, three dimensional structure, and reaction mechanisms, especially the mechanisms of addition to double bonds, nucleophilic substitution and elimination reactions. Functional groups covered will emphasize hydrocarbons and derivatives that contain halogens, oxygen, sulphur, and the hydroxyl group.

Prerequisite: CHEM 101 or 103.

*NOTE: Students who have credit for CHEM 164 cannot take CHEM 261 for credit. Engineering students who take this course will receive *4.5.*

Instructor

Dr. Sean Fenwick

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Office Hours

Mondays	2:30 – 3:30 pm
Tuesdays	10:00 – 12:00 am
Thursdays	9:00 – 11:00 am

Hours of Instruction

Lecture:	Tuesdays	1:00 – 1:50 pm	CC-235
	Thursdays	8:00 – 8:50 am	CC-235
	Fridays	2:00 – 2:50 pm	CC-235
Laboratory:	Mondays	9:00 – 11:50 am	CC-236

Required Resources

1. **Organic Chemistry, 12th Ed.** 2016. Solomons, Fryhle and Snyder. ISBN: 978-1118875766
   Electronic versions also available at vitalsource.com and amazon.ca.
2. **Chemistry 261 Laboratory Manual**. Winter 2019 Edition. Keyano College.
3. **Student Lab Notebook**; Plymouth, Michigan: Hayden-McNeil, LLC; available in the bookstore
4. **Molecular Model Kit**, Molecular Visions Kits available at the Keyano Bookstore.
5. **Laboratory coat.** Available at the Keyano Bookstore.

Additional Resources

1. **Moodle (http://ilearn.keyano.ca)**. The course outline, lecture notes and other resources will be made available on Moodle**. ****Please download or print lecture notes before coming to class.

2. **Textbook Website**: http://bcs.wiley.com/he-bcs/Books?action=index&itemId=1118875761&bcsId=10134

3. **Problem Sets.** Problem sets will be given throughout the semester and are designed to help you learn the material and prepare for tests and exams. It is your responsibility to complete each problem set and check solutions. Questions from problems sets may appear on tests and exams.

Course Outcomes

Upon successful completion of this course, the student will be able to:

- Perform typical organic chemistry experiments, with an emphasis on laboratory safety.
- Explain the hybridization of carbon atoms in different hydrocarbons, and correlate the hybridization with their chemical properties.
- Employ IUPAC nomenclature rules to name hydrocarbons and properly identify their stereoisomers and diastereoisomers.
- Use molecular model kits for understanding the conformations of alkanes and cycloalkanes, as well as the stereochemistry in some important organic reactions, such as the bromination of *cis* or *trans* stilbene.
- Understand important organic chemistry mechanisms, such as radicalic substitution for alkanes, electrophilic addition for alkenes, and nucleophilic substitution/elimination (SN1, SN2, E1, E2) for alkyl halides and alcohols.

Evaluation

Laboratory	25%
Midterm I Exam	15%
Midterm II Exam	25%
Final Exam	35%
Total	100%

A grade of C- is required for progression or transfer.

Tests and Examinations

Absences from tests or exams will result in a mark of zero (0%), unless the absence is verified (doctor's note or other acceptable excuse).

The final lecture examination is cumulative and **must** be written in order to complete this course.

Laboratory

The laboratory component is detailed in the course laboratory manual and includes written assignments and a final lab exam.

Students are expected to attend all labs, complete all lab assignments and achieve a minimum of 60% for the lab grade in order receive a passing grade in the course.

Grading System

Descriptor	Alpha Grade	4.0 Scale	Percent	Rubric for Letter Grades
Excellent	A+	4.0	> 92.9	Work shows in-depth and critical analysis, well developed ideas, creativity, excellent writing, clarity and proper format.
	A	4.0	85 – 92.9	
	A-	3.7	80 – 84.9	
Good	B+	3.3	77 – 79.9	Work is generally of high quality, well developed, well written, has clarity, and uses proper format.
	B	3.0	74 – 76.9	
	B-	2.7	70 – 73.9	
Satisfactory **Progression**	C+	2.3	67 – 69.9	Work has some developed ideas but needs more attention to clarity, style and formatting.
	C	2.0	64 – 66.9	
	C-	1.7	60 – 63.9	
Poor **Minimum Pass**	D+	1.3	55 – 59.9	Work is completed in a general way with minimal support, or is poorly written or did not use proper format.
	D	1.0	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

Schedule of Topics

	Text Chapters
BASICS OF ORGANIC CHEMISTRY	
1. Structure and Bonding	1
2. Functional Groups and Nomenclature	2
3. Acids and Bases: An Introduction to Organic Reactions	3
ISOMERS	
4. Alkanes, Isomers and Conformations	4
5. Stereochemistry: Chiral Molecules	5
CHEMISTRY OF HYDROCARBONS	
6. Nucleophilic Substitution and Elimination: Reactions of Alkyl Halides and Alcohols	6,7
7. Alkenes and Alkynes: Preparation by Elimination Reactions; Hydrogenation	7
8. Alkenes and Alkynes: Addition Reactions	8
9. Other reactions of alcohols, alkenes and alkynes	11

Please Note:

To facilitate unforeseen time constraints, time allotted to each topic is subject to change.

Performance Requirements

Student Responsibilities

It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College credit calendar.

More specific details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

Laboratory Safety

In the science laboratories, safety is important and therefore students must complete the *WHMIS for Students* online training course on Moodle before entering the science laboratories.

Students must comply with the mandatory laboratory safety rules for this course as provided in the laboratory manual. Failure to do so will result in progressive discipline such as a verbal warning, refused entry into the laboratory, or suspension from the College.

Before entering the lab, students are responsible reviewing the lab manual and relevant Safety Data Sheets for the purpose of evaluating risks associated to health. Some hazards used in the laboratory may have additional risks to those with pre-existing medical conditions.

Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a students' learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and / or notes that may be due.

Academic Misconduct

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own
- The use of unauthorized aids in assignments or examinations (cheating)
- Collusion or the unauthorized collaboration with others in preparing work
- The deliberate misrepresentation of qualifications
- The willful distortion of results or data
- Substitution in an examination by another person
- Handing in the same unchanged work as submitted for another assignment
- Breach of confidentiality.

The consequences for academic misconduct range from a verbal reprimand to expulsion from the College. More specific descriptions and details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

In order to ensure your understanding of the concept of plagiarism, you must successfully complete the online tutorial found on ilearn.keyano.ca. Then print the certificate, sign it, and show it to each of your instructors. Your course work will not be graded until you show this signed certificate.

Specialized Supports

The Student Academic Support Services (SASS) department: Accessibility Services, Skill Centre and Wellness Services, work together to support student success at Keyano College.

Accessibility Services (CC167) supports student success through group and individualized instruction of learning, study and test taking strategies, and adaptive technologies. Students with documented disabilities, or who suspect a disability, can meet with the Learning Strategists to discuss accommodation of the learning barriers that they may be experiencing. Students who have accessed accommodations in the past are encouraged to visit our office at their earliest opportunity to discuss the availability of accommodations in their current courses. Individual appointments can be made by calling 780-791-8934

Skill Centre (CC119) provides a learning space where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff. Students visiting the centre have access to one-to-one or group tutoring, facilitated study groups, and assistance in academic writing. The Skill Centre's Peer Tutor program provides paid employment opportunities for students who have demonstrated academic success and want to share what they have learned. Tutoring is available free to any students registered at Keyano College on a drop in basis, from 9:00 am to 5:00 pm Monday through Friday. Additional evening hours are subject to tutor availability and are posted in the Skill Centre.

Wellness Services (CC260) offers a caring, inclusive, and respectful environment where students can access free group and individual support to meet academic and life challenges. Mental Health Coordinators offer a safe and confidential environment to seek help with personal concerns. The Mindfulness Room in CC260 is available as a quiet space for students to relax during regular office hours. Wellness Service welcomes students to participate in any of the group sessions offered throughout the academic year addressing such topics as Mindfulness and Test Anxiety. Individual appointments can be made by calling 780-791-8934.

Please watch your Keyano email for workshop announcements from our Student Academic Support Services team.