

CHEM 261A: ORGANIC CHEMISTRY I

3 credits, 14 weeks, 3 hours lecture per week, 3 hours laboratory per week

Course description: 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.

Instructor

Dr. Blaine Legaree

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Office Hours

Mondays	12:00 – 1:00 pm
Tuesdays	12:00 – 2:00 pm
Wednesdays	9:00 – 9:50 am
Thursdays	12:00 – 1:00 pm

Hours of Instruction

Lecture:	Wednesdays	12:00 – 12:50 pm	Rm S214
	Thursdays	10:00 – 10:50 am	Rm S214
	Fridays	3:00 – 3:50 pm	Rm S216
Laboratory:	Mondays	9:00 – 11:50 am	Rm 236

Required Resources

1. **Organic Chemistry, 11th Ed.** 2013. Solomons, Fryhle and Snyder. ISBN: 978-1118133576
Also available for digital rental at <http://www.coursesmart.com/9781118133576>
2. **Chemistry 261 Laboratory Manual.** Winter 2015 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. **Text Website:** <http://bcs.wiley.com/he-bcs/Books?action=index&itemId=1118133579&bcsId=8215>
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:

1. Perform typical organic chemistry experiments, with an emphasis on laboratory safety.
2. Explain the hybridization of carbon atoms in different hydrocarbons, and correlate the hybridization with their chemical properties.
3. Employ IUPAC nomenclature rules to name hydrocarbons and properly identify their stereoisomers and diastereoisomers.
4. 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.
5. 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

Unit Tests (5)	40%	Thursdays: Jan 22, Feb 5, Feb 19, Mar 12, Mar 26
Laboratory	25%	<i>Evaluation detailed in the laboratory manual.</i>
Final Examination	35%	<i>Date to be set by the Registrar</i>

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 and complete all lab assignments in order receive a passing grade.

Students who fail to achieve at least 60% of the Lab Grade will receive a failing 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	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.
Minimum Pass	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. Molecular Structure and Bonding in Organic Chemistry	1
2. Functional Groups; Nomenclature	2
3. Reactivity in Organic Chemistry; Acids And Bases	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. 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:

Date and time allotted to each topic is subject to change. 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.

Performance Requirements

Laboratory Safety

In the science laboratories, safety is important. 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.

Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a student's 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.

Students are required to attend and complete all labs in Chem 261. *Unexcused absence from any lab period or failure to submit a lab report may result in a failing grade in the course. If a lab is missed for a valid reason, a makeup lab may be attended to complete the work.*

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

Penalties for academic offences range from a verbal reprimand to dismissal from the College, and in certain circumstances may involve legal action.

Specialized Supports

Counselling and Disability Services

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

SKILL Centre

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.

Authorization

This course outline has been reviewed and approved by the Program Chair.

Blaine Legaree, Instructor

Louis Dingley, Chair

Date Authorized

Guy Harmer, Dean

Date Authorized

Signed copies to be delivered to:

Instructor

Registrar's Office