



Course Outline

UNIVERSITY STUDIES

**CHEM 261
ORGANIC CHEMISTRY I
Winter 2014**

**3 CREDITS
3 hours lecture, 3 hours laboratory per week**

INSTRUCTOR: Dr. Blaine Legaree

INSTRUCTOR: Dr. Blaine Legaree
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E-MAIL: blaine.legaree@keyano.ca
OFFICE NUMBER: S209D
OFFICE HOURS: Mondays 12:00 – 12:50 PM; 2:00 – 2:50 PM
Tuesdays 12:00 – 1:50 PM
Thursdays 12:00 – 12:50 PM

HOURS OF INSTRUCTION:

| | | |
|--------------------|---------------------------|-----------|
| Lectures: | Wednesdays 8:00 – 8:50 AM | Room S214 |
| | Fridays 11:00 AM–12:50 PM | Room 224 |
| Laboratory: | Mondays 9:00 – 11:50 AM | Room 236 |

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.

PRE-REQUISITE(S): Chemistry 101 or 103.

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

REQUIRED RESOURCES:

1. **Organic Chemistry, 11th Ed.** 2013. Solomons, Fryhle and Snyder. John Wiley & Sons, Inc.
*Available for digital rental at <http://www.coursesmart.com/9781118133576>
Older editions of this textbook may also be acceptable; please consult with your instructor.*
2. **Chemistry 261 Laboratory Manual.** Winter 2014 Edition. Keyano College.
Old editions of the lab manual are NOT acceptable.
3. **Student Lab Notebook;** Plymouth, Michigan: Hayden-McNeil, LLC; available in the bookstore
4. **Molecular Visions Molecular Model Kit (Darling),** on sale in the bookstore.
*In case you wish to share costs, one half of a Molecular visions kit will give enough models.
Alternate models are acceptable as long as they give ball-&-stick models that can be rotated
about the bonds, with plenty of 109° and 120° bond angles.*
5. **Lab Coat.** *Extra long – must go down to the knees.*
6. **Safety Course:** *You require Keyano WHMIS/Biosafety training for this course.*

ADDITIONAL RESOURCES:

MOODLE: This course is supported online through Moodle (<http://ilearn.keyano.ca>). The course syllabus, lecture notes, problem sets, weblinks, other electronic resources will be made available to you on Moodle.

** It is important that you download or print the lecture notes **before** coming to class.*

TEXTBOOK WEBSITE: <http://bcs.wiley.com/he-bcs/Books?action=index&itemId=1118133579&bcsId=8215>

OTHER TEXTS (ON LIBRARY RESERVE):

Introduction to Organic Chemistry, Streitwieser and Heathcock; QD251.2 S915

(This text is more advanced, but is particularly good reference and useful for alternative explanations of course material.)

Chemistry, Zumdahl; QD31.2 Z95

This is a general chemistry textbook.

PROBLEM SETS:

Problem sets will be posted throughout the duration of the course that will help you learn the material and prepare for examinations. It is the student's responsibility to complete each problem set in time to check the solutions. Solutions will be posted on Moodle shortly after the problem set is issued. Questions from problems sets may appear on exams.

TOPICS TO BE COVERED:

Please Note: This course outline may be modified to facilitate unforeseen time constraints. Dates and time allotted to each topic is subject to change.

| <u>Lecture Topics</u> | <u>Text Chapters*</u> |
|---|-----------------------|
| <i>BASICS OF ORGANIC CHEMISTRY</i> | |
| 1. Molecular Structure and Bonding in Organic Chemistry | 1 |
| 2. Functional Groups; Nomenclature | 2 |
| 3. Reactivity in Organic Chemistry; Acids And Bases | 3 |
| <i>ISOMERS</i> | |
| 4. Alkanes; Isomers; and Conformations | 4 |
| 5. Stereochemistry: Chiral Molecules | 5 |
| <i>CHEMISTRY OF HYDROCARBONS</i> | |
| 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. Alcohols and Ethers | 11 |

EVALUATION:

| | | |
|-----------------------------------|------------|--|
| Weekly Quizzes/Assignments | 10% | <i>Due dates announced in class</i> |
| Midterm Examination | 25% | February 21, 2014 |
| Laboratory Reports | 17% | <i>See the lab manual for details</i> |
| Laboratory Exam | 8% | April 7, 2014 |
| Final Examination | 40% | <i>Date to be set by the Registrar</i> |

Students who do not complete all the required work should not expect to pass the course.

Weekly Assignments and Quizzes: will be announced during lectures at least 1 day in advance of the due date or quiz time. Credit will not be given for quizzes missed due to absence. *Assignments submitted late will not normally be accepted for grading.*

Exams are based on material covered in lectures and labs. The final exam is cumulative, but will focus on material covered following the midterm.

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

Please note that travel plans will not be accepted as a valid excuse for missing a final exam.

Students should consult: <http://www.keyano.ca/Academics/Examinations>

Labs: The laboratory component is detailed in the course laboratory manual and includes written assignments, reports and a final lab exam. *Students who fail to achieve at least 60% of the Lab Grade will receive a failing grade in the course.*

Lab Attendance and Reporting: Students are required to attend all labs unless excused by the instructor for valid reasons. (Note: "valid reasons" cannot include extracurricular activities.) *Unexcused absence from any laboratory period or failure to submit a lab report may result in your being assessed a failing grade in the course.* The rules governing late submission of lab reports are detailed in the Laboratory Guide section in the lab manual.

Note: Lectures, study questions, lab assignments, and textbook readings are all designed to help you succeed in this course. Completing assignments and attending lectures are essential to your success. Students who do not complete all the required work should not expect to pass the course. Good study habits, such as reviewing material in advance of the midterms and participating in class, will also aid your efforts.

GRADING SYSTEM:

| Letter Grade | Description | Grade Points |
|--------------|--------------|--------------|
| A+ | | 4 |
| A | Excellent | 4 |
| A- | | 3.7 |
| B+ | | 3.3 |
| B | Good | 3 |
| B- | | 2.7 |
| C+ | | 2.3 |
| C | Satisfactory | 2 |
| C- | | 1.7 |
| D+ | | 1.3 |
| D | Minimal Pass | 1 |
| F | Failure | 0 |

Students intending to transfer to other institutions should strive for a 'C-' as a minimum. Transfer information on each course is available at the [Alberta Council on Admission and Transfers](#).

IMPORTANT DATES:

| | |
|-------------|---|
| Jan 17 | Courses dropped after this date will be designated "W". (A withdrawal (W) is not reflected in your GPA) |
| Feb 17 | Family Day (no classes) |
| Feb 21-25 | Reading Week (no classes) |
| Mar 7 | Courses dropped after this date will be designated "WF". (A withdrawal failure (WF) counts as a 0 in your GPA) |
| Apr 17 | Last day of classes |
| Apr 18 & 21 | Good Friday (no classes) |
| Apr 21 | Easter Monday (no classes) |
| Apr 22-30 | Final Exams |

CLASSROOM AND LABORATORY POLICIES:

- **Regular attendance is expected at lectures and attendance will be taken.** The lectures will often include material which is not in your textbook or the emphasis in class may differ from that in the text; you will be responsible for the material taught. Notes and PowerPoints should be thought of as **study guides**: you must take additional notes in class to do well!
- **Students must wear a lab coat and a pair of safety goggles while working in the chemistry lab.** This coat must be worn at all times when you are in the lab, regardless of the activity you are involved in. If you normally wear contact lenses, you should switch to regular glasses for lab work. *You should never wear contact lenses in a lab.*
- **Cell Phones and Electronic Devices:**
Except by express permission of the instructor, cell phones and other electronic devices:
 - a) Can be used in class only for course relevant work;
 - b) Should not be a disruption to other students;
 - c) Must be turned off and stored in a designated area during all exams.

COLLEGE POLICIES

*Students should consult the Keyano College Credit Calendar
(online at: <http://www.keyano.ca/Academics/CreditCalendar>)*

Equality, Equity and Respect

The Keyano College is committed to providing an environment of equality, equity and respect for all people within the College community. All members of this community are considered partners in developing teaching and learning contexts that are welcoming to all. Faculty, staff, and students are encouraged to use inclusive language to create a classroom atmosphere in which students' experiences and views are treated with equal respect and valued in relation to their gender, ethnic and cultural background, and sexual orientation.

Students should consult: <http://www.keyano.ca/StudentLife/StudentConduct/IndividualRightsPolicy>

Plagiarism and Cheating

Every student expects to be treated and evaluated fairly in a course. Plagiarism and cheating robs everyone of this right.

No student may submit words, ideas or data of another student or person as his or her own in any writing, project, assignment, quiz, electronic presentation, exam etc. Any work used that is not the student's own must be clearly cited as belonging to someone else. There are penalties for using other's work and not citing it. The Student's Rights & Responsibilities document clearly outlines these penalties and the appeal process.

- No learner can obtain information from another student during an exam.
- No learner can bring unauthorized information (paper or electronic) into an exam or quiz.
- No student can submit work done in another course for grading in this course without the written prior approval of the course instructor.
- No student can submit copyright protected or commercially produced materials as part or all of an assignment without proper citation & permission.

Student Rights & Responsibilities

Students should consult the Keyano College Credit Calendar or online at:

<http://www.keyano.ca/CurrentStudents/StudentConduct/StudentRightsResponsibilities>

Specialized Supports and Duty to Accommodate

Disability Support Services: Learner Assistance Program

If you have a documented disability or you think that you would benefit from some assistance from a Disabilities Counsellor, please call or visit the Disability Supports Office 780-792-5608 to book an appointment (across from the library). Services and accommodations are intended to assist you in your program of study, while maintaining the academic standards of Keyano College. We can be of assistance to you in disclosing your disability to your instructor, providing accommodations, and supporting your overall success at Keyano College.

Specialized Supports and Duty to Accommodate

Specialized Support and Duty to Accommodate are aligned with the office of Disability Support Services: Learner Assistance Program (LAP) guided by federal and provincial human rights legislation, and defined by a number of Keyano College policies. Keyano College is obligated by legislation to provide disability-related accommodations to students with identified disabilities to the point of undue hardship.



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Winter 2014**

**3 CREDITS
3 hours lecture, 3 hours laboratory per week**

Dr. Blaine Legaree, Instructor

Date

Reviewed and approved by:

Louis Dingley, Chairperson

Date

Guy Harmer, Dean

Date