



Course Documentation Outline

School of Business, Biosciences and Justice Studies

SECTION I

1. Program (s): All Bioscience Programs
2. Course Name: Organic Chemistry I
3. Course Code: CHEM1001 Credit Value: 3
4. Course Hours: 42

Class	Lab	Field	Other	Total
42				42

5. Prerequisites/Corequisites/Equivalent Courses

PR/CO/EQ	Course Code	Title
N/A		

6. **Faculty:** Karen Holder **Date:** 31 Aug, 2010 **Effective Date:** Sept 7, 2010
7. **Dean/Chair Approval:** *Jim Whiteway* **Date:** August 2010
9. **Revision Number:** **Date:** **Effective Date:**
10. **Notes:** A passing grade is 60%

Section II

11. Calendar Description:

This course is designed as an introduction to organic chemistry. Upon successful completion of this course the student will be able to: define organic chemistry, draw and name (IUPAC) moderately complex organic molecules, apply the principles of bonding and isomerism to recognition and production of molecular structures, predict physical properties of various compounds based on structure, determine the products of major organic reactions, recognize the unique properties of aromatic compounds, and describe practical applications of organic chemistry to everyday life and biological systems.

12. Provincial Context:

This course meets the following Ministry of Education and Training requirements:

a). Prior Learning Assessment (PLA)

Students may apply to receive credit by demonstrating achievement of the course learning outcomes through previous life and work experiences.

This course is eligible for challenge through the following method(s) indicated by *

Challenge Exam	Portfolio	Interview	Other	Not Eligible
X				

PLAR Contact:

13. Employability Skills emphasized in this course

X	communication - written	X	communication - visual	X	communication - oral
X	analytical	X	creative thinking		decision making
X	interpersonal	X	numeracy		organizational
X	problem solving	X	technological		other (specify)

14. Recommended Texts, Materials, Resources or Technical Materials:

There is no required text for this class. Any college-level organic chemistry text will provide you with the necessary content to support learning in this course. For students who would like to work from a text, there is one available in the Loyalist College bookstore (General, Organic and Biochemistry) that will serve as an excellent study aid for General Chemistry 1&2, Organic Chemistry 1&2, and Biochemistry (if you save it for another two years). Several other Organic Chemistry texts are also available for review and short-term loan in the library.

15. Evaluation Plan

Students will demonstrate learning in the following ways:

Assignment Description	Evaluation Methodology	Due Date
Worksheets, problem sets and quizzes for modules on i) Saturated Hydrocarbons, ii) Unsaturated Hydrocarbons, iii) Alcohols, Phenols, Thiols and Ethers, iv) Aldehydes and Ketones	In-class and take-home assignments. Marks assigned may vary; total will equal 35%	Weekly or bi-weekly
Peer-led workshop participation	In-class and workshop participation and collaboration; 10%	Ongoing
Midterm test	Answer key; 20%	Approximately Week 8
Independent study and essay	Rubric; 5%	8 December
Final term test	Answer key; 30%	15 December

Please note that this evaluation plan is tentative, and may be subject to change as the need arises.

16. Other

Please consult the Biosciences Handbook for Students (2010-2011) for information and policies on Course Outlines, Assessment, Evaluation and Grading, Supplemental Exams and Plagiarism and Academic Dishonesty. Briefly:

- ◆ You must always submit your own work for evaluation. The minimum penalty for plagiarism is a mark of 0% on the assignment, report, test, etc.
- ◆ Class assignments and problem sets are due as outlined when the assignment is given. Some assignments may be designed to be completed during class time. If you are absent for the class, you may not make up the assignment.
- ◆ Please advise me in advance if you cannot write a test or exam, or meet deadlines for assignments. However, I reserve the right to refuse to reschedule assessments or accept late assignments. If I accept a late submission, be aware that a penalty (10-50%) will accrue, depending on the circumstances.
- ◆ A supplemental exam is available if you meet the criteria as outlined in the Biosciences Handbook for Students

Loyalist College has a **Violence Prevention** policy:

- All college members have a responsibility to foster a climate of respect and safety, free from violent behaviour and harassment.
- Violence (e.g. physical violence, threatening actions or harassment) is not, in any way, acceptable behaviour.
- Weapons or replicas of weapons are not permitted on Loyalist College property.
- Unacceptable behaviour will result in disciplinary action or appropriate sanctions
- More information can be found in the "Student Manual and Guide".

Section III**17. Curriculum Delivery, Learning Plan and Learning Outcomes:**

Course Components/Content	Related Learning Outcomes	Learning Activities/Resources
An Introduction to Organic Chemistry: The Saturated Hydrocarbons	<ul style="list-style-type: none">• Compare and contrast organic and inorganic compounds.• Draw structures that represent each of the families of organic compounds.• Write the names and draw the structures of the common functional groups.• Write condensed and structural formulas for simple hydrocarbons.• Describe the relationship between the structure and physical properties of saturated hydrocarbons.• Use the basic rules of the IUPAC Nomenclature System to name alkanes and substituted alkanes.• Draw constitutional (structural) isomers of simple organic compounds.• Write the names and draw the structures of simple cycloalkanes.• Draw <i>cis</i>- and <i>trans</i>- isomers of cycloalkanes• Describe conformations of alkanes.• Draw the chair and boat conformation of cyclohexane.• Write equations for combustion reactions of alkanes.• Write equations for halogenation reactions of alkanes.	<ul style="list-style-type: none">• Attend, listen and take notes in lectures• Review examples explained in class• Complete assigned homework problems• Supplement with readings in texts• Participate in class/group discussions• Use web-based activities• Test knowledge, comprehension, and application through regularly scheduled evaluations• Participate and contribute to problem based team learning workshops• Write a short essay which illustrates a practical application of organic chemistry to <i>your</i> life that was not covered in class.

<p>The Unsaturated Hydrocarbons: Alkenes, Alkynes, and Aromatics</p>	<ul style="list-style-type: none"> • Describe the physical properties of alkenes and alkynes. • Draw the structures and write the IUPAC names of simple alkenes and alkynes. • Write the names and draw the structures of simple geometric isomers of alkenes. • Write equations predicting the products of the simple addition reactions of alkenes: hydrogenation, hydration, halogenation, and hydrohalogenation. • Apply Markovnikov's rule to predict the major and minor products of the hydration and hydrohalogenation reactions of unsymmetrical alkenes. • Write equations representing the formation of addition polymers of alkenes. • Draw the structures and write the names of common aromatic hydrocarbons. • Write equations for substitution reactions involving benzene. • Describe heterocyclic aromatic compounds and list several biological molecules in which they are found. 	<p>See previous</p>
<p>Alcohols, Thiols and Ethers</p>	<ul style="list-style-type: none"> • Rank selected alcohols by relative water solubility, boiling points, or melting points. • Write the IUPAC names and draw the structures of common alcohols. • Discuss the biological, medical, or environmental significance of several alcohols. • Classify alcohols as primary, secondary, or tertiary. • Write equations representing the preparation of alcohols by the hydration of an alkene. • Write equations representing the preparation of alcohols by the hydrogenation (reduction) of aldehydes and ketones. • Write equations showing the dehydration of an alcohol. • Write equations representing the oxidation of alcohols. • Discuss the role of oxidation and reduction reactions in the chemistry of living systems. • Write IUPAC names and draw structures for common ethers and discuss their use in medicine. • Write equations representing the dehydration between two alcohol molecules. • Write IUPAC names and draw structures for simple thiols and discuss their biological significance. 	<p>See previous</p>

Aldehydes and Ketones	<p>Draw the structures and discuss the physical properties of aldehydes and ketones.</p> <ul style="list-style-type: none">• From the structures, write the common IUPAC names of aldehydes and ketones.• List several aldehydes and ketones that are of natural, commercial, health, and environmental interest and describe their significance.• Write equations for the preparation of aldehydes and ketones by the oxidation and reduction of alcohols.• Write equations representing the oxidation of carbonyl compounds.• Write equations representing the reduction of carbonyl compounds.• Draw the keto and enol forms of aldehydes and ketones.	See previous
Selected topics in Organic Chemistry	Discuss additional topics of interest, as time permits	See previous