



CHE 251

Organic Chemistry I

Semester: Fall, 2014

Days: 11:15

Room: A2212

Lab – day: 8:15

Lab–Room: 2151

Number of credits: 3

Prerequisite:

CHEM 101 and CHEM 103

Instructor: Dr Ross Gilmore

Email: rgilmore@ambrose.edu

Phone: 403-410-2000 ext 5914

Office: A2__

Office By appointment

hours: 10:00 am m/f

Course Description:

This course addresses the chemistry of organic compounds – their structure and bonding, aromaticity, their stereochemistry, thermodynamics as it relates to organic chemistry principles; and NMR/IR/Mass-spectroscopy.

Further Course Information:

Organic chemistry focuses on the chemistry of carbon. In fact, the chemistry of life is both organic and bio chemistries. The molecules of cells are organic as having arisen from organisms. Consequently, a basic grounding in organic chemistry enables a learner to better understand the chemical principles at play within living organisms. It also serves as a primer for development of a clearer picture of the bio mechanistic processes involved in cellular growth, decay, and development, and those of systemic or specific drug interactions.

To succeed in organic chemistry students are strongly advised to read relevant topics in their text the day before or morning of their lectures. An experienced student will also review their notes within several hours of the lecture to shift acquired knowledge from short to long-term memory. In addition, since organic chemistry involves problem solving, students are encouraged to practice these skills by completing the questions at the end of each chapter. It is not likely that you will be able to learn organic chemistry through memorization. Rather, learn the reasons why reactions occur and you will be able to predict the outcome of almost any reaction.

Expected Learning Outcomes:

Important Dates:

First day of classes: September 3, 2014

Registration revision period: September 14, 2014

Last day to request revised examination: October 27, 2014

Last day to withdraw from course: November 12, 2014

Last day to apply for time extension for coursework: November 24, 2014

Last day of classes: December 9, 2014

It is the aim of the instructor that students acquire the following skills:

1. Background and fundamental knowledge required to move forward into Organic Chemistry II.
2. An understanding of the core concepts of organic chemistry such as functional group chemistry, electrophiles/nucleophiles, and electron movement
3. Learning of basic organic chemistry terminology,
4. An ability to do introductory level organic synthesis and predictive arrow pushing
5. Insight into biochemical processes as well as aspects of the commercial applications of organic chemistry.

Final Exam: December 17th

Time: 1:00

Room: Airhart

Outline:

Week Starting, Monday,	Text Sections (Klein)	Lecture Topics (Wed and Fri)	Lab Topics, Mondays at 8:15 am
Sept. 1st Tuesday is an orientation day. Lectures start Wed.	All of chapter 1	Review of GenChem principles; bonding, atomic and molecular orbitals, formal charge, Lewis diagrams	No labs
Sept 8 th	Chapter 1, chapter 2, pages 263/264, pages 501/502	Formulas: Lewis, three dimensional, organic-shorthand line drawings. Resonance; carbocations and carbanions and their relative stability	Dry Lab #1: Check-in and Organic Techniques, nomenclature and structure assignment for credit. Quiz #1
Sept. 15 th	Chapter 4	Alkanes and cyclic alkanes, hybrid orbitals, conformers, ring strain, intro to substituted alkanes	Lab 1-A: Separation of Solids
Sept 22 nd No classes on Wednesday. It is a spiritual emphasis day; as is thurs	Chapter 4 Chapter 6 Chapter 9 Chapter 11	Synthesis of alkanes and substituted alkanes, nomenclature Free radical halogenation and intro to arrow pushing, free energy. Alcohols, synthesis, reactions	Lab 1-B: Separation of Solids
Sept 29th	Chapter 13, Chapter 7,	Alcohol nomenclature. Nucleophilicity SN ₁ rxn and rate laws (RX from ROH), SN ₂ reactions and rate laws (RX from ROH)	Dry Lab #2; handout for credit assignment (moodle doc) Quiz #2
Oct. 6 th	Chapter 5	Stereochemistry, chirality, nomenclature of enantiomers, optical	Dry Lab: Review and tutorial. Possibly a

		activity, enantiomer synthesis	3rd quiz. <i>Instructor will be absent for part of session (faculty meeting)</i>
Oct. 13 th (Thanksgiving day holiday on monday)	Chapter 5,	1st midterm in class Wednesday, Oct 15th. Fischer projections of diastereomers. Reactions leading to diastereomers, resolution of enantiomers	No lab, thanksgiving
Oct. 20 th	Chapter 4	Cyclohexane conformers, ring flipping, conformer stability. Ring strain, crowding.	Lab 2-A: Thin Layer Chromatography Lab 2-B: Thin Layer Chromatography
Oct. 27 th	Chapter 8	Elimination reactions (E1 and E2 mech's), dehydrohalogenation (alkene synthesis), alkene nomenclature and stereochemistry. Zaytzev's and Hoffmans rules.	Lab 3: Distillation, parts A and B
Nov. 3 rd (remembrance day holiday on Friday, the 11th)	Chapter 8, Chapter 9	Hydrogenation and hydration of alkenes, electrophilic addition of HX , free radical addition	Lab 4-A1/A2: Nucleophilic Substitution and GC analysis
Nov. 10 th Tuesday November 11th is remembrance day	Chapter 10	Alkynes, nomenclature, properties, hybridization, reactions. Intro to redox reactions: permanganate oxidation and ozonolysis of unsaturated hydrocarbons 2nd midterm in-class Wed., the 12th	Lab 4-B, Properties of alkanes and alkenes
Nov. 17 th	Chapter 16	Proton and ¹³ C-NMR theory and examples.	<i>Lab 5: Stereochemistry of Bromination</i>
Nov. 24 th	Chapters 15, 16, 17	Intro to Mass-spec, infra-red spec, and UV-spec	Lab 6: Dry Lab only : Spectroscopy, IR, NMR
Dec 1st	Chapters 24, 25, 26, & 27	Polymerization of organic molecules, biopolymers, Organics in biology.	Dry Lab 6 cont'd: Mass Spectroscopy and UV-vis (Handout and Assignment for credit)
Dec 8 th Last day of		No lectures since Tuesday is the last day of classes	<i>Lab Exam Check out, hand in your lab logs</i>

classes is the 9th			<i>for marking</i>
		Final Exams Dec 11 th to 18 th Date of final TBD	

Requirements and Evaluation:

Assignments and/or Quizzes	6%
Midterm Exam #1	11%
Midterm Exam II	13%
Laboratory log	20%
Lab Exam	10%
Final Exam	40%

You must attain at least 50% in the lab component to pass the course.

*An example of how to fill in your lab log is included as a preface to your lab manual content. Assignments are listed in the table above and due at the start of the next lab session. Quizzes and exams are in-lab and in-class, respectively.

Submission of Assignments:

Lab assignments are to be submitted in hard copy to the instructor at the start of the following lab session. No late assignments will be accepted. Lab logs should be in a bound booklet. No three ring binders or duotangs.

Attendance:

Attendance and participation at labs is mandatory. Failure to attend a lab or labs will result in failure of the course regardless of performance by any other measures.

Grade Summary:

The available letters for course grades are as follows:

<u>Letter Grade</u>	<u>Description</u>
A+	
A	Excellent
A-	
B+	
B	Good
B-	
C+	
C	Satisfactory
C-	
D+	
D	Minimal Pass
F	Failure

Percentage (%)	Grade	Grade Point
93-100	A+	variable
86-92	A	4.0
80-85	A-	3.7
78-79	B+	3.3

74-77	B	3.0
70-73	B-	2.7
68-69	C+	2.5
64-67	C	2.0
60-63	C-	1.7
56-60	D+	1.5
50-55	D	1.0
0-49	F	0

Please note that final grades will be available on the student registration system. Printed grade sheets are no longer mailed out.

Textbooks:

Required:

- I. *Organic Chemistry*: Klein, David 2nd Ed (or earlier), John Wiley and Sons, Publisher
- II. *Laboratory Manual: Selected Organic Chemistry Laboratory Experiments*. This manual is an Ambrose University Compilation and will be used as a guide and resource throughout the laboratory component of the course. Availability is via your course website on Moodle.

Recommended :

Organic Chemistry, T.W. Graham Solomons, 9th Ed or earlier.
Another good text is Joel Karty's, Organic Chemistry, Principles and Mechanisms

Required Materials:

Lab coat, lab notebook, and lab glasses/goggles, immediately, and an organic chemistry model kit by mid-October.

Supplemental Materials:

You may find the U of C O-chem sit helpful. Their website is: <http://www.chem.ucalgary.ca/courses/350/index351-f13.html> . They have a series of web pages that are complementary to the earlier edition of Carey's Organic Chemistry text. They also use the Jones O-Chem text and have some supporting material for that version.

Policies:

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. If students do not wish to use their Ambrose accounts, it is highly recommended that they forward all messages from the Ambrose account to the other account.

During the **Registration Revision Period** students may to enter a course without permission, change the designation of any class from credit to audit and /or voluntary withdraw from a course without financial or academic penalty. These courses will not appear on the student's transcript. Courses should be added or dropped on the student portal by the deadline date, please consult the List of Important Dates. After that date, the original status remains and the student is responsible for related fees.

Students intending to withdraw from a course after the Registration Revision Period must apply to the Office of the Registrar by submitting a Request to Withdraw from a Course by the **Withdrawal Deadline**, please consult the List of Important Dates.

Withdrawal from courses after the Registration Revision period will not be eligible for tuition refund. A grade of “W” will appear on the student’s transcript.

Students wishing to withdraw from a course, but who fail to do so by the applicable date, will receive the grade earned in accordance with the course syllabus. A student obliged to withdraw from a course after the Withdrawal Deadline because of health or other reasons may apply to the Registrar for special consideration.

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 List of Important Dates. Requests will be considered for the following reasons only: 1) the scheduled final examination slot conflicts with another exam; 2) 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.

Electronic Etiquette

Students are expected to treat their instructor, guest speakers, and fellow students with respect. It is disruptive to the learning goals of a course or seminar and disrespectful to fellow students and the instructor to engage in electronically-enabled activities unrelated to the class during a class session. Please turn off all cell phones and other electronic devices during class. Laptops should be used for class-related purposes only. Please do not use iPods, MP3 players, or headphones. Do not text, read, or send personal emails, go on Facebook or other social networks, search the internet, or play computer games during class. The professor has the right to disallow the student to use a laptop in future lectures and/or to ask a student to withdraw from the session if s/he does not comply with this policy. Repeat offenders will be directed to the Dean. If you are expecting communication due to an emergency, please speak with the professor before the class begins.

Academic Policies

It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Academic Calendar. Personal information, that is information about an individual that may be used to identify that individual, may be collected as a requirement 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.

Extensions

Although extensions to coursework in the semester are at the discretion of the instructor, students may not turn in coursework for evaluation after the last day of the scheduled final examination period unless they have received permission for a “**Course Extension**” from the Registrar’s Office. Requests for course extensions or alternative examination time must be submitted to the Registrar’s Office by the deadline date, please consult the List of Important Dates. Course extensions are only granted for serious issues that arise “due to circumstances beyond the student’s control”.

Appeal of Grade

An appeal for change of grade on any course work must be made to the course instructor within one week of receiving notification of the grade. An appeal for change of final grade must be submitted to the Office of the Registrar in writing within 30 days of receiving notification of the final grade, providing the basis for appeal. A review fee of \$50.00 must accompany the appeal to review final grades. If the appeal is sustained, the fee will be refunded.

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 College 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 give credit 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 college. 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.

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

Other

LAB SAFETY:

Lab coats and goggles are mandatory. You **must** abide by the regulations outlined in your lab manual. Proper handling and disposal of chemicals is important to protect, the environment, your fellow students, and your own health. Every chemical used in the laboratory comes with a WHMIS sheet. If you are uncertain regarding risks, ask your lab instructor, and/or refer to the WHMIS information sheet. Be familiar with all safety equipment and emergency exits within the lab. Hair should be tied back, no open shoes/sandals, avoid wearing contact lenses since many organic chemicals are readily absorbed by the gas permeable material of the lenses and are difficult to eradicate. Always be attentive and **think** about the risks associated with the lab procedure in progress. Many organic chemicals can cause adverse health effects and many are potential carcinogens.