

CHEM 263A – Organic Chemistry II

3 credits, 16 weeks, 3 hours lecture, 3 hours lab

Chemistry 263 continues the study of molecular structure and reactivity of organic compounds with oxygen containing functional groups, conjugated dienes and aromatic compounds, amines and molecules of biological importance. The course includes an introduction to the use of organic spectroscopy in the determination of molecular structure.

Prerequisite: CHEM 164 or CHEM 261

Instructor

Dr. Sorin Nita

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Office Hours

Monday 9:00 AM – 12:00 PM

Tuesday 10:00 AM – 11:00 AM

Friday 10:00 AM – 11:00 AM

Hours of Instruction

Monday 8:00 AM – 9:00 AM Room S216

Tuesday 9:00 AM – 10:00 AM Room S216

Thursday 9:00 AM – 12:00 PM Lab 236

Friday 9:00 AM – 10:00 AM Room S216

Required Resources

1. **Organic Chemistry**; Solomons, T.W.G.; Fryhle, C.B.; Snyder, S.A.; John Wiley & Sons, Inc., 2014, 11th edition, ISBN 978-1-118-13357-6.
The 10th edition of this textbook is also acceptable.
2. **Chemistry 263 Laboratory Manual**; Keyano College, 2014/2015 edition.
The old editions of the lab manual are not acceptable.
3. **Student Lab Notebook with Permanent Binding**; Hayden-McNeil, Plymouth, Michigan, ISBN 978-1-930882-00-3
4. A non-programmable scientific calculator (Sharp EL-531, used for exams, is recommended).
5. Extra long lab coat.

Course Outcomes

The student will be able to:

1. Perform many organic chemistry laboratory techniques, such as refluxing, distillation, recrystallization, melting point determination, and use safety procedures to ensure a safe working environment for all students.
2. Understand organic spectroscopy (with an emphasis on proton NMR) and correlate organic structures with spectroscopic features.
3. Create organic synthesis pathways of obtaining one compound from another, by applying a logical understanding of organic reactions and mechanisms.

- Understand important organic chemistry mechanisms, such as allylic/benzylic radicalic substitution, electrophilic aromatic substitution, nucleophilic addition for carbonylic compounds (aldehydes and ketones), nucleophilic addition - elimination for carboxylic acids and derivatives.
- Correlate typical mechanisms that appear in organic chemistry with the reactivity of biochemical compounds (carbohydrates, lipids, and proteins).

Evaluation

Assignments	10%
Laboratory	25%
Midterm Exams	30%
Final Exam	35%
Total	100%

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

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.

Proposed Schedule of Topics

1. Organic Spectroscopy	textbook chapters
• The electromagnetic spectrum, Ultraviolet-Visible spectroscopy	9.1, 13.9
• Review of Infrared spectroscopy, Detecting functional groups	2.16
• Nuclear Magnetic Resonance, Chemical shift	9.2-9.12
• NMR in aromatic compounds	14.7B, 14.11A
• Mass Spectrometry, Fragmentation	9.13-9.16
• Spectra for aldehydes, ketones, carboxylic acids, amines	16.13, 18.2J, 20.12B

2. Conjugated dienes, aromatic compounds.

- Resonance, Conjugated unsaturated systems 1.12, 13.1-13.11
- Aromatic compounds 14.1-14.9
- Reactions of aromatic compounds 15.1-15.15
- Reactions of diazonium salts 20.7B, 20.8, 20.9
- Electrophilic aromatic substitutions 20.5B, 21.8, 21.11

3. Organic compounds with carbonyl and carboxyl functional groups

- Alcohols from carbonyl compounds 12.1-12.8, 12.10
- Aldehydes and Ketones I: Nucleophilic addition 16.1-16.14
- Aldehydes and Ketones II: Enols and enolates 17.1-17.6
- Carboxylic acids and their derivatives 18.1-18.11

4. Amines and Biomolecules.

- Amines 20.1-20.12
- Carbohydrates 22.1-22.8
- Amino acids and proteins 24.1-24.10, 24.12

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.

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.

[First Name, Last Name], Instructor

[First Name, Last Name], Chair

Date Authorized

Guy Harmer, Dean

Date Authorized

Signed copies to be delivered to:

Instructor

Registrar's Office