

**CONCORDIA UNIVERSITY
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY**

**CHEM 222 01
INTRODUCTORY ORGANIC CHEMISTRY II**

SYLLABUS – Fall 2021

As passing the laboratory portion is a requirement to pass the course, students who are unable to meet the above conditions and requirements **are advised that they will need to drop the course**. Students are advised that the drop deadline (DNE) for this course is **September 20, 2021**. Students who require additional accommodations for their laboratory component due to a documented disability should contact the Access Centre for Students with Disabilities for assistance.

GENERAL INFORMATION

Introduction to the use of IR and NMR spectroscopy for the identification of simple organic compounds. Benzene and aromatic compounds: Aromaticity, electrophilic aromatic substitution, nucleophilic aromatic substitution, substituent effects. Chemistry of aldehydes and ketones: Nucleophilic addition, oxidation, reduction, and condensation reactions, tautomerism. Chemistry of carboxylic acids and their derivatives. Chemistry of alcohols, ethers, and related compounds. Amines: Basicity, reactions. Lectures and laboratory. Prerequisites: CHEM 206 and 221.

INSTRUCTOR	Professor M. Paladino marco.paladino@concordia.ca
COURSE FORMAT	Lectures and Laboratory (mandatory)
LECTURE HOURS	T - J 10:15 – 11:30
(required) TEXTBOOK	<i>Organic Chemistry</i> , 4th Edition by David Klein Study Guide and Solutions Manual - Organic Chemistry, 3rd Edition by David Klein <u>Introductory Organic Chemistry II Lab Manual</u>
COURSE WEBSITES	Moodle: CHEM 222 01 2212, 222 LAB 2212
OFFICE HOURS	On-line by appointment (please add “CHEM 222” in the subject line, and do not reply directly to a Moodle announcement, always send to my email address above). Due to the high number of students I teach and the current pandemic, minimizing physical contact and gatherings is still important. I will also make myself available on Saturdays and Sundays.

COURSE WITHDRAWAL

Students who withdraw from the course must also check-out from their lab section. You may only attend the lab and receive a mark for lab work, if you are registered in the course. **Monday, September 20, 2021 is the last day for academic withdrawal from Fall-term courses.**

LECTURES AND READING

Following the current health guidelines, the lectures will be held in person. However, for exceptional occasions or if new health measures are taken, the lectures will be delivered online with pre-recorded presentations or with a live zoom class. The lectures are designed to reinforce and clarify the textbook material. You are responsible for all the material in Chapters 11 to 20 (Klein 4th Edition), except where explicitly stated otherwise.

Always come to class prepared, whether the class is in-person or online. You are expected to read the relevant chapters of the textbook and online materials **before** the lecture, carefully take your own notes during the lecture, and work through your notes **after** the lecture. Plan your time to review the textbook material and take down important takeaways to your notes. In this course, you will learn many reactions and their mechanisms. Although software like ChemDraw or ChemsSketch is very handy, it is VERY IMPORTANT to practice drawing structures and arrow-pushing mechanisms on an actual sheet of paper. Writing a reaction mechanism is totally different from just picturing it in your mind (you may think you know the mechanism but you actually don't!). You will have to practice those repeatedly, at least at the early stage of your learning.

Have pencil and paper and the lecture slides ready to take notes as you (re-)read the chapters. You cannot succeed in this course without practice!

Students should note that the material in chapters 8 and 9 (alkenes and alkynes) in Klein (4th Edition) were covered in Chemistry 221 and should be reviewed. A familiarity with this material and the concepts of SN1, SN2, E1 and E2 reactions (chapter 7) are required background for this course.

STRATEGIC LEARNING

In order to help you perform to the best of your ability the department of Student Learning Services has organized Strategic Learning (SL) Groups (see http://learning.concordia.ca/SL_basics.shtml) SL leaders are undergraduate students who have recently taken the selected course and done well in it. Their role is to facilitate collaborative learning among students who attend the groups. To this end, they are trained so that they can help students develop effective learning and study strategies appropriate to course material.

Their role is not to lecture and teach the course content but rather to help students interact with course material using effective learning strategies. Sessions of one hour each are scheduled outside class time, usually at 2 different times each week. Attendance is voluntary; groups are open to all students in the class throughout the semester.

COURSE OUTLINE

Schedule may be subject to changes

Date	Topic	Chapters in Klein (4 th Ed.)
Sep 7 th	Alcohols, Phenols	12
Sep 9 th	Ethers, Epoxides, Thiols and sulfides	13
Sep 14 th	Aromatic compounds	17
Sep 16 th	Aromatic substitution reactions	18
Sep 21 st	Aromatic substitution reaction	18
Sep 23 rd	Pi systems and pericyclic reactions	16.1 – 16.7
Sep 28 th	Retrosynthetic analysis	11
Sep 30 th		
Oct 5 th	Midterm 1	
Oct 7 th	Aldehydes and Ketones	19
Oct 12 th	Aldehydes and Ketones	19
Oct 14 th	Enols and enolates	21
Oct 19 th	Enols and enolates	21
Oct 21 st	Carboxylic acids and their derivatives	20
Oct 26 th	Carboxylic acids and their derivatives	20
Oct 28 th	Amine	22
Nov 2 nd	Midterm 2	
Nov 4 th	Uv-IR	14
Nov 9 th	Uv-IR	14
Nov 11 th	Mass	14
Nov 16 th	Mass	14

Nov 18 th	Lab Exam	
Nov 23 rd	NMR	15
Nov 25 th	NMR	15
Nov 30 th	NMR	15
Dec 2 nd	NMR	15

EXAMINATIONS

There will be four (4) formal examinations. Currently they are planned to be in person, but be ready for online exams if the situation changes.

1. Midterm Exam 1 on **October 5, 2021**,
2. Midterm Exam 2 **November 2, 2021**,
3. Lab Exam (in class) **November 18, 2021** (see below) and
4. Final Exam after the end of classes and arranged by the Exams Office.

In Exams 1 and 2 and the Final Exam you are allowed to use to use a personal scientific calculator, ruler and pencil or pen and plastic molecular models.

If you are absent from Exam 1, Exam 2 or the Lab Exam, you must produce a written excuse appropriately signed (i.e., by a doctor or an employer) on the appropriate letterhead paper. This letter must be emailed to the Professor as soon as possible but **no later than one (1) week after the exam**. The Department determines the validity of the absence. A make-up exam will **only** be offered for the Lab Exam, and only if the absence is valid. If you lack an excuse or if your excuse is not valid, you will receive a mark of zero for the exam. In case of a valid absence for Exams 1 and/or 2, the percentage will be transferred on the Final Exam.

POP QUIZZES/PARTICIPATION

There will be 5 pop quizzes that will be introduced in the lectures, for you to work on after class as practice material. These will be timed and marked. The mark will enter into your course grade out of 10% (2% for each quiz).

PROBLEM SETS

There will not be formal problem sets or assignments.

LABORATORY INFORMATION

The laboratory coordinator is Vincent Lau (office: SP 201.10; tel.: 848-2424 x 5976; email: Vincent.Lau@concordia.ca). All questions related to the labs should be addressed to him. Experiments will begin the week of Monday, September 13th. The lab manual is available as a coursepack entitled, "Introductory Organic Chemistry II Lab Manual", which is available at the university bookstore. You are also required to purchase a laboratory notebook. Lab coats and safety glasses are compulsory and **must be worn in the laboratory at all times**.

Students who are repeating the course, and have passed the lab component within the past two (2) years, may request a lab exemption. Applications for the exemption are available in SP 201.01. Signed and completed forms are to be returned to the Chemistry Reception in person (SP 275.01) or by email (chemistry.reception@concordia.ca) by **Friday, September 10** at noon. Late applications will not be accepted. Students **MUST** register for the appropriate lab exemption lab/tutorial section; students registered in any other lab/tutorial sections will be required to complete the lab portion of the course (NO EXCEPTIONS). When a student receives a lab exemption for a lab taken at Concordia, the previous lab mark will be used again in determining the new grade.

“quiz” column for you.

PLAGIARISM AND OTHER FORMS OF ACADEMIC DISHONESTY

The Academic Code of Conduct can be found in section 17.10 of the academic calendar (<http://www.concordia.ca/academics/undergraduate/calendar/current/17-10.html>). Any form of unauthorized collaboration, cheating, copying or plagiarism found in this course will be reported and the appropriate sanctions applied. The mandatory seminar is a clear and fair opportunity to learn what our faculty regards as academic misconduct. Failure to take part in this learning opportunity and thus ignorance of these regulations is no excuse and will not result in a reduced sanction in any case where academic misconduct is observed.

COURSE GRADE

The final grade of the course is based on the marks obtained in lecture and laboratory (which includes the lab exam) parts. The composition of the final course grade is as follows:

5 Pop quizzes/Participation	10% (2% each) (date TBA)
In-class Mid term Exams	30%, (15% each)
Final Exam	35%, date TBA
Lab Exam	10%
Labs	15%

Separate minimum passing marks are required for the lectures (weighted average) and the laboratory (weighted average). The minimum passing mark for the lecture part is 50% (D–), for the lab part 60% (C–). The Minimum passing mark for the lab exam is 50% (see above). The grading scheme (percentage to letter grade) follows:

Passing Grades:

A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-
100-93	92-86	85-80	79-77	76-73	72-70	69-67	66-63	62-60	59-57	56-53	52-50

Failing Grades:

F	R
<50 (theory)	<40 (theory) or <50 (lab exam) or <60 (lab)

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

M. Paladino
August 2021