CHEMISTRY 222/2 Sect. 01 **Fall 2022** **10:15 - 11:30 Tuesday and Thursday in HC-155**

Introductory Organic Chemistry II (3 credits)

Instructor: **Dr. Christopher J. Wilds**
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Email: Chris.Wilds@concordia.ca

Office Hours: Wednesdays from 14:00 - 15:00 (or by appointment)

Course Description: 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.

Course Materials and Textbooks:

Course materials including Powerpoint slides, examples of class tests, examples of final exams and e-Reserves (under Chem 222) from the Concordia University Library will be available on the Chem 222 Course Moodle site.

Recommended: Organic Chemistry, 4th Edition by David Klein
Study Guide and Solutions Manual - Organic Chemistry, 4th Edition by David Klein

Required: Introductory Organic Chemistry II Lab Manual

Grading:

		Method A	Method B
Midterm Exam	October 27th (in class, 1 ¼ hr)	25 %	15 %
Lab Exam	November 29th (in class, 30 min)	10 %	10 %
Labs	consult the calendar	15 %	15 %
Final Exam	TBA	50 %	60 %

The most advantageous method will be used to calculate your grade!

Separate minimum passing marks are required for theory (weighted average of the midterm and final exam), for the labs (weighted average of lab reports and lab exam) and for the lab exam. Minimum passing marks for theory and lab exam is 50% and for labs is 60%.

In the event of extraordinary circumstances and pursuant to the Academic Regulations, the University may modify the delivery, content, structure, forum, location and/or evaluation scheme. In the event of such extraordinary circumstances, students will be informed of the changes.

If you miss a class test due to a medical emergency or other valid reason you must (1) email me immediately and (2) provide me with a signed medical note or appropriate documentation on a letterhead, within 4 days of the missed class test. If the document is valid, then the weight of the class test will be shifted to the final exam.

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 S_N1, S_N2, E1 and E2 reactions (chapter 7) are required background for this course.

Laboratory Information:

The laboratory coordinator is Mr. 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. The schedule and other important information for the laboratory can be found on the Chem 222 Lab Moodle site. The laboratory manual is available for purchase from Follett (the link can be found on the Chem 222 Course Moodle site) as a coursepack entitled, "Introductory Organic Chemistry II Lab Manual". 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 that have passed the lab component within the past two (2) years with a previous course grade of F or higher may request a lab exemption. Applications for the exemption are available on the Chemistry and Biochemistry Department website. Signed and completed forms are to be returned to Lisa Montesano (chemistry.reception@concordia.ca) by **Friday, September 9th, 2022** at noon. Late applications will not be accepted. Students MUST register for the appropriate lab exemption lab section; students registered in any other lab 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.

You must pass the laboratory portion to pass the course! Your lab grade will be based on lab reports (15 %) and a lab exam (10 %). **You must obtain 15 / 25 (and pass the laboratory exam) or you will fail the course with an "R" grade.**

Strategic Learning (SL):

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 https://www.concordia.ca/students/success/learning-support/math-help.html#strategic) 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 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.

Mandatory Quiz and Seminar:

CHEM 101: The Academic Code of Conduct: Ethical Use of Information Sources

As part of your CHEM course, you are ***required*** to i) attend a Chemistry and Biochemistry Departmental Seminar on the academic conduct code and the appropriate use of information sources and ii) pass the online quiz associated with this seminar (the passing grade for the quiz is 100%). (**Note:** this quiz is graded by the Department of Chemistry and Biochemistry, and you do not have access to it until after you have attended the seminar. Therefore, any other quiz you may have taken on the academic code of conduct does not count toward the CHEM 101 requirement.) The aim of this seminar and quiz is to clarify the academic conduct code in terms of which practices will be considered unacceptable with regards to work submitted for grading in your CHEM course. **You are only exempt from repeating the seminar and the**

quiz if you have done both in Fall 2017 or more recently,* otherwise you are required to repeat both this term. This short seminar (1 hour) will be held at the following times (note that you will not be given credit if you join too late and/or leave too early):

Date (Fall 2022)	Time	Mode	Registration link
Sept. 21 (Wednesday)	21:00-22:00	Zoom	https://concordia-ca.zoom.us/meeting/register/tZYkduivqDkpHtVmJJllg74uA5HiKQC-ZaM8
Sept. 22 (Thursday)	21:00-22:00	Zoom	https://concordia-ca.zoom.us/meeting/register/tZElc-6rrzwvE9WHVZfXXuhROaPhEUnVARTU
Sept. 26 (Monday)	19:00-20:00	Zoom	https://concordia-ca.zoom.us/meeting/register/tZAsc-iqqzkrGNIX7oPpwXcdqVH9Mc3inWP8

As space for each of the Zoom seminars is limited, please **register early** for your preferred slot (copy the corresponding link above into your browser, and make sure you do not introduce a space: it is "concordia-ca"). Then do not forget to **attend** that seminar slot on the date above!

We will take attendance at the Zoom seminar.

If you do not complete this course requirement, your final grade for the course may be lowered by one full letter grade with an incomplete (INC) notation until such time as this requirement is completed. Please refer to the undergraduate calendar (section 16.3.5) for details on removal of an incomplete notation.

* You are exempt if you can locate your ID in the pdf file located on the Departmental web site (http://www.concordia.ca/content/dam/artsci/chemistry/docs/Compliance-list.pdf) and if there is no entry in the "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.

Behavior:

All individuals participating in courses are expected to be professional and constructive throughout the course, including in their communications.

Concordia students are subject to the Code of Rights and Responsibilities which applies both when students are physically and virtually engaged in any University activity, including classes, seminars, meetings, etc. Students engaged in University activities must respect this Code when engaging with any members of the Concordia community, including faculty, staff, and students, whether such interactions are verbal or in writing, face to face or online/virtual. Failing to comply with the Code may result in charges and sanctions, as outlined in the Code.

List of Student Services:

1. Access Centre for Students with Disabilities: http://www.concordia.ca/students/accessibility.html
2. Student Success Centre: http://www.concordia.ca/students/success.html
3. Counselling and Psychological Services: http://www.concordia.ca/students/counselling.html
4. Library Citation and Style Guides: https://library.concordia.ca/help/citing
5. Health Services: http://www.concordia.ca/students/health.html
6. Financial Aid and Awards: http://www.concordia.ca/offices/faao.html
7. Academic Integrity: http://www.concordia.ca/conduct/academic-integrity.html
8. Dean of Students Office: http://www.concordia.ca/offices/dean-students.html
9. International Students Office: http://www.concordia.ca/students/international.html
10. Student Hub: http://www.concordia.ca/students.html
11. Sexual Assault Resource Centre: www.concordia.ca/conduct/sexual-assault.html
12. CSU Advocacy Centre: https://www.csu.qc.ca/services/advocacy/
13. Aboriginal Student Resource Centre: http://www.concordia.ca/students/aboriginal.html

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CHEM 222 SCHEDULE - FALL 2022
(may be subject to change)

Term dates: Sept. 6 - Dec. 22

LAST DATE TO WITH TUITION REFUND = Sept. 19
LAST DATE TO DROP CLASS (DISC) = Dec. 8

Date	Topic	Chapters in Klein (4th edition)	Suggested Problems in Klein (4th edition)
Sept. 6 Sept. 8	Introduction and Mass Spectrometry	14.8-14.11, 14.12 (Fragmentation of Alkanes), 14.16	14.18, 14.19, 14.22, 14.23, 14.24 a,b, 14.27, 14.30, 14.31, 14.38, 14.40, 14.47, 14.48
Sept. 13 Sept. 15	Infrared Spectroscopy and UV & VIS Spectroscopy	14.1-14.7, 16.11 (The Information in a UV-Vis Spectrum), 16.12	14.9, 14.10, 14.12, 14.14, 14.15, 14.17, 14.34, 14.35, 14.36, 14.37, 14.45, 14.46, 14.49, 14.54, 14.56, 14.65, 14.66
Sept. 20 Sept. 22 Sept. 27	Nuclear Magnetic Resonance Spectroscopy	15.1-15.3, 15.4 (Chemical Equivalence), 15.5-15.12, 17.8, 19.13, 20.15, 22.13	15.3, 15.5, 15.8, 15.10, 15.11, 15.12, 15.13, 15.15, 15.16, 15.21, 15.26, 15.32, 15.33, 15.35, 15.36, 15.37, 15.38, 15.42, 15.47, 15.48, 15.55, 15.56, 15.57, 15.58, 15.59, 15.72, 15.73, 15.74, 17.22 a, 17.23 a, 17.61, 19.87, 20.85, 22.31, 22.87, 22.88
Sept. 29 Oct. 4	Reactions of Dienes / Delocalized Electrons	16.1-16.5	16.4, 16.6, 16.7, 16.9, 16.31, 16.33, 16.35, 16.36
Oct. 6	Reactions of Alcohols, Ethers, Epoxides and Sulfur Containing Compounds	12.1-12.3, 12.9-12.10, 13.1-13.8, 13.10-13.12, 23.1-23.3	12.4, 12.6, 12.8, 12.9, 12.19, 12.20, 12.21, 12.22 a,b,c,e, 12.32, 12.33, 12.34 a,b,c,e,f,g,h,I,j,k, 12.35, 12.40, 12.41, 12.45 a,b, 12.46 a,b,c,d, 12.65 c,e, 12.66, 13.5, 13.7, 13.8, 13.9, 13.10, 13.13, 13.16 a,b,c,e, 13.17, 13.18, 13.20, 13.21 a,b, 13.22 a,b,c,d, 13.24 a,c,e,g,h,i, 13.27, 13.29, 13.37, 13.38, 13.39, 13.41, 13.42, 13.44, 13.45, 13.59, 23.2, 23.5
Oct. 11	**READING DAY - NO LECTURE**		
Oct. 13 Oct. 18	Reactions of Alcohols, Ethers, Epoxides and Sulfur Containing Compounds	12.1-12.3, 12.9-12.10, 13.1-13.8, 13.10-13.12, 23.1-23.3	12.4, 12.6, 12.8, 12.9, 12.19, 12.20, 12.21, 12.22 a,b,c,e, 12.32, 12.33, 12.34 a,b,c,e,f,g,h,I,j,k, 12.35, 12.40, 12.41, 12.45 a,b, 12.46 a,b,c,d, 12.65 c,e, 12.66, 13.5, 13.7, 13.8, 13.9, 13.10, 13.13, 13.16 a,b,c,e, 13.17, 13.18, 13.20, 13.21 a,b, 13.22 a,b,c,d, 13.24 a,c,e,g,h,i, 13.27, 13.29, 13.37, 13.38, 13.39, 13.41, 13.42, 13.44, 13.45, 13.59, 23.2, 23.5
Oct. 20 Oct. 25	Aromaticity - Reactions of Benzene	17.1-17.6, 17.7 (Hydrogenation), 18.1-18.6	17.17, 17.18, 17.42, 17.43, 17.46, 17.50, 17.57, 17.58, 17.60, 17.61, 18.2, 18.4, 18.5, 18.8, 18.9, 18.38
Oct. 27	**MIDTERM EXAM (75 min, 10:15 - 11:30)**		
Nov. 1 Nov. 3	Reactions of Substituted Benzenes	18.7-18.12, 22.11	18.11, 18.12, 18.13, 18.14, 18.15, 18.16, 18.18, 18.20, 18.22, 18.24, 18.25, 18.26, 18.28, 18.39, 18.40, 18.41, 18.42, 18.43, 18.44, 18.45, 18.46, 18.47, 18.49, 18.52, 18.53, 18.54, 18.55, 18.61, 18.63, 18.64, 18.65, 18.66, 18.67, 18.73, 18.74, 18.75, 18.86, 18.90, 22.26 a,b,c,d
Nov. 8 Nov. 10	Carboxylic Acids, Derivatives of Carboxylic Acids: Acyl Compounds	20.1-20.14	20.4, 20.5, 20.6, 20.9, 20.10, 20.11, 20.14, 20.16, 20.17, 20.18, 20.19, 20.20, 20.21, 20.22, 20.24, 20.25, 20.27, 20.29, 20.30, 20.32, 20.35, 20.45, 20.46, 20.47, 20.48, 20.50, 20.51, 20.53, 20.61, 20.70, 20.71, 20.72
Nov. 15 Nov. 17	Carbonyl Chemistry: Addition Reactions	8.13, 12.4, 12.6, 19.1-19.7, 19.9-19.10, 19.12	19.5, 19.6, 19.8, 19.10, 19.12, 19.13, 19.14, 19.15, 19.17, 19.18, 19.19, 19.20, 19.23, 19.28, 19.30, 19.31, 19.32, 19.33, 19.34, 19.49, 19.52, 19.55, 19.57 a,b,c, 19.59, 19.60, 19.61, 19.63, 19.74, 19.75, 19.76, 19.84, 19.85, 19.90, 19.91
Nov. 22 Nov. 24	Carbonyl Chemistry: Reactions at the α Position	21.1, 21.2 (Alpha Halogenation in Acidic Conditions, Alpha Halogenation in Basic Conditions: The Haloform Reaction), 21.3 (Aldol Additions), 21.5 (Alkylation via Enolate Ions)	21.1, 21.2, 21.3, 21,4, 21.8, 21.9, 21.12, 21.13, 21.14, 21.29, 21.30, 21.47, 21.50, 21.51, 21.52, 21.53, 21.78 a,g
Nov. 29	**LAB EXAM (30 min, 10:15 - 10:45)**		
Dec. 1	Amines	22.1-22.4, 22.5 (Alkylation of Ammonia), 22.6, 22.8, 22.10 (Primary Amines and Nitrous Acid)	22.7, 22.10, 22.22, 22.44, 22.50, 22.54 b
Dec. 6	Review		
FINAL EXAM PERIOD (DECEMBER 9 - 22)			

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