

CHEM 222 - INTRODUCTORY ORGANIC CHEMISTRY II - Fall 2007

GENERAL INFORMATION

Introductory Organic Chemistry I and II (Chem 221 & 222) are a two-semester sequence required for all programmes in Chemistry, Biochemistry and Biology. Chem 221 is a prerequisite for Chem 222. Chem 222 will (i) introduce important spectroscopic techniques used for determining the structures of organic compounds, and (ii) introduce the main reactions of alcohols, ethers, aromatic compounds, carbonyl compounds and amines.

Instructor **Dr. Carrie W. Rogers**

Office hours: Tues. – Fri. 13:15-14:15 (or by appointment) in SP-201.17

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Course Format Lectures: 2.5 h / week, 26 sessions; Tues. & Thurs. 10:15-11:30 in SP-S110
Labs: 4 h / week, starting Sept.10-14th; section specified on your Portal; Lab room SP-112

Materials required

- 1) P.J. Bruice, *Organic Chemistry*, 5th Edition (orange & white), Prentice Hall Publishing
- 2) Bruice's 5th Ed. Study Guide & Solutions Manual, Prentice Hall Publishing
- 3) *Lab text*: J. W. Lehman, *Operational Organic Chemistry*, 3rd Ed., Prentice Hall Publishing
- 4) *Lab manual*: Concordia Dept. of Chem. & Biochem., *Organic Chemistry II*
- 5) any molecular model kit (e.g., Darling's Molecular Visions, or any other kit)

Useful resources

- 1) Course website (moodle site on your MyConcordia Portal): for lecture slides, handouts, problem sets
- 2) Bruice text's website (<http://www.prenhall.com/bruice/details.html>): for tutorials, problems, quizzes...
- 3) Other textbooks (on reserve at Loyola's Vanier library): for alternate explanations, problems

Molecular models

Using models helps considerably with many aspects of organic chemistry – many concepts require you to picture, rotate and draw 3D objects. Models **are** permitted in exams. You are strongly advised to buy or share a model kit (any type sold in the bookstore is fine).

Lectures and readings

Lectures will reinforce and clarify the textbook, with emphasis on important concepts. A combination of blackboard and powerpoint will be used – come to class prepared to take notes. The best approach to success in organic chemistry is to work at it every day, starting the first day of class – **cramming does not work for organic chemistry!** Keep up-to-date with the lecture material. Take detailed notes during class, then work through them after class. Read the relevant sections of the textbook for clarification, elaboration, and illustrative examples, and use your molecular models to aid with 3-D visualization. Then, practice applying your knowledge by working through problems. The textbook's study guide provides worked solutions for every problem in the book, but be careful with this – to learn, you must work at a problem with pen & paper before you look to the solution for verification of your answer or to get a quick hint.

GRADING SCHEME, DEADLINES & ABSENCES

To pass the course, you must earn $\geq 50\%$ on theory (problem sets, midterm, final exam) AND $\geq 60\%$ on the laboratory work. The final grade will be weighted as follows:

Problem Sets:	10%	(distributed in class; each due approximately two weeks after handed out)
Midterm Exam:	15%	(during class time on Oct.23)
Laboratory Marks:	25%	(lab reports 15%; lab exam 10% held during class time on Nov.22)
Final Exam:	50%	(in December; scheduled by Exams Office)

Problem Sets must be handed in at the beginning of class on the due date. Late submissions will not be accepted. Papers slid under an office door will not be graded. Solutions to the problems will be posted after the due date.

If absent from an examination, you must produce a written excuse on letterhead paper, appropriately signed (e.g., by doctor or employer), **no later than one week** after the exam. The Department determines the validity of the absence and necessary arrangements will be made. If **no valid excuse** is produced, the student will receive a **zero** grade for the missed test.

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STRATEGIC LEARNING (see also http://learning.concordia.ca/SL_basics.shtml)

Research shows that students who attend Strategic Learning groups earn higher grades and withdraw less often than students who do not participate. Strategic Learning (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. 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 course content but rather to help students interact with course material using effective learning strategies. The SL sessions integrate how to learn with what to learn. Students have the opportunity to become actively involved in the course material as the SL leaders use the text and lecture notes as vehicles for improving students' study skills and learning strategies and thus their understanding of course content. Sessions of one hour each are scheduled outside class time, usually at different times each week. Attendance is voluntary; groups are open to all students in the class throughout the semester. Early in the term, the SL leader assigned to our course will introduce himself / herself to the class and announce the times and locations of the SL sessions. **Please take advantage of this free programme!**

PLAGIARISM AND OTHER FORMS OF ACADEMIC DISHONESTY - MANDATORY QUIZ AND SEMINAR

As part of this 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 (note: passing grade for the quiz is 100%). The aim of this seminar is to clarify the academic conduct code in terms of what practices will be considered unacceptable with regards to work submitted for grading in Chemistry and Biochemistry courses. Should you have already attended these sessions you are not required to repeat them this semester. This short seminar (1 hour) will be held at the times shown in the table.

As space for each of the seminars is limited by the room size, please sign up to your preferred time. Sign up sheets are available inside SP-201.01 (Departmental office).

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 notation until such time as this requirement is completed. Please refer to the undergraduate calendar (section 16.3.6) for details on removal of an incomplete notation.

The academic code of conduct can be found in section 16.3.14 of the academic calendar in either printed or the online (<http://registrar.concordia.ca/calendar/pdf/sec16.pdf>) versions. Any

form of 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.

Date	Time	Place
Tuesday, Sept. 11	16:45 - 17:45	CC-321
Tuesday, Sept. 11	20:30 - 21:30	CC-321
Wednesday, Sept. 12	16:45 - 17:45	CC-320
Wednesday, Sept. 12	20:30 - 21:30	CC-320
Thursday, Sept. 13	16:45 - 17:45	CC-321
Thursday, Sept. 13	20:30 - 21:30	CC-321
Friday, Sept. 14	16:45 - 17:45	CC-321
Monday, Sept. 17	16:45 - 17:45	CC-320
Wednesday, Oct. 3	20:30 - 21:30	SP-S110

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LABORATORY INFORMATION

The laboratory coordinator is **Rita Umbrasas**, SP-330.01, Tel. (514) 848-2424 x3354. **All questions on matters related to the lab component of the course should be addressed to her.** All students must attend the section for which they are registered. Changes will be considered only in exceptional circumstances (e.g., course conflict). If you miss a lab, you must provide a medical note, or you will receive a grade of zero. **Only one absence is allowed.** Laboratory performance is graded on the quality of the experimental work and the report, as well as the Lab Exam.

The Chem 222 laboratories are located in SP-112. Starting the week of Monday, Sept. 10th, you will have a lab EVERY week; please refer to the attached schedule of experiments. Each laboratory section will have one or two demonstrators (TAs); be sure to write down your TAs' contact information in case you need to reach them.

Materials required for labs:

- 1) J. W. Lehman, *Operational Organic Chemistry*, 3rd Ed., Prentice Hall Publishing; (at University Bookstore)
- 2) *Organic Chemistry II, Laboratory Manual*, Dept. of Chemistry & Biochemistry;
- 3) a lab coat and safety glasses (mandatory, to be worn at all times in the lab).

Students who are repeating the course may request to be exempted from the labs by contacting Rita Umbrasas during the first week of lectures. If denied exemption, the laboratory component of the course must be repeated.

Students who withdraw from the course must also check out from the lab. Only students officially registered in the course may attend the lab and receive a grade for lab work.

Date:	Experiment No.	Title:
Mon. Sept. 10 - Fri. Sept. 14	Check In Exp. 4	All Sections Synthesis of Salicylic Acid from Wintergreen
Mon. Sept. 17 - Fri. Sept. 21	Exp. 9	Isolation and Isomerization of Lycopene from Tomato Paste
Mon. Sept. 24 - Fri. Sept. 28	Exp. 11	Identification of Unknown Ketones
Mon. Oct. 1 - Fri. Oct. 5	Exp. 7	Preparation of Camphor
Mon. Oct. 8 - Fri. Oct. 12	(No Labs – Thanksgiving Holiday)	
Mon. Oct. 15 - Fri. Oct. 19	Exp. 42	Haloform Oxidation of 4'-methoxyacetophenone
Mon. Oct. 22 - Fri. Oct. 26	Exp. 20	Reaction of Iodoethane with Sodium Saccharin, an Ambident Nucleophile
Mon. Oct. 29 - Fri. Nov. 2	Exp. 31	Synthesis of Triphenylmethanol and the Trityl Carbocation
Mon. Nov. 5 - Fri. Nov. 9	Exp. 31	Synthesis of Triphenylmethanol and the Trityl Carbocation
Mon. Nov. 12 - Fri. Nov. 16	Exp. 32	Hypochlorite Oxidation of an Alcohol (Hand – Out)
Mon. Nov. 19 - Fri. Nov. 23	Exp. 32	Hypochlorite Oxidation of an Alcohol Check – Out

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Lecture Section /2 - 01 Dr. Carrie Rogers Tues/Thurs 10:15-11:30am SP-S110

Readings & problems from: P.J. Bruice, *Organic Chemistry*, 5th Ed., Prentice Hall Publishing.

- You are not responsible for every section of each chapter; consult the readings list & lecture notes from class.
- Read the Preface of the textbook, pages xxx-xxxi, "To the student" – Dr. Bruice gives suggestions on how to use her textbook and some excellent advice on how to study organic chemistry.
- Use this schedule (subject to change) as a guideline to keep on track with your reading & to plan your study goals.

Class	Date	Topics	Readings	Suggested problems from Bruice
1	Sept.04	Introduction (<i>Review Chem 221</i>)	(4.12, 6.12, 9.11)	(see <i>Chem 221 past exams on website</i>)
2	Sept.06	Reactions of alcohols, ethers, epoxides & sulphur-containing compounds	4.9, 10.1-10.12, 19.2-19.3	Ch.10 #1,5,7,9,11,13,14,15,17,23,31,33,34, 43a-h,44,46,49 (not h),51,52,57,61,64,70,71; Ch.19 #8,10.
3	Sept.11			
4	Sept.13	Mass spectrometry (MS)	12.1-12.5	Ch.12 #2,3,5,10,12,13,14,15.
5	Sept.18			
6	Sept.20	Infrared spectroscopy (IR)	12.6-12.15	Ch.12#19,20,21,22,23,24,29,33,43,45,49,54, 56,58,60,61,65,66,69.
7	Sept.25	UV/Vis spectroscopy (UV/Vis)	12.16-12.20	Ch.12 #37,46.
8	Sept.27			
9	Oct.02	Nuclear magnetic resonance spectroscopy (NMR)	13.1-13.7,13.9-13.14, 13.16-13.17, 13.18	Ch.13 #3,4,5,10,11,12,13,15,17,18,19,21, 27,28,30,32,38,40,41,43,45,46,48,50,54, 56,57,71,72.
10	Oct.04			
11	Oct.09			
12	Oct.11	Reactions of dienes/delocalized e ⁻ s	7.4-7.12	Ch.7 #17,18,21,25,28,33,36,42,45,55, 68,70,72.
13	Oct.16	Aromaticity; reactions of benzene	7.1-7.3, 14.1-14.16, 14.18-14.19	Ch.14 #3,4,20,24,26,28,37,39,42.
14	Oct.18			
15	Oct.23	Midterm Exam	Includes Oct.9 class	
16	Oct.25	Reactions of substituted benzenes	15.1-15.10	Ch.15 #5,6,8,9,10,12,14,16,17,36,38, 39,43,48,52, 54,61,63.
17	Oct.30			
18	Nov.01	Carbonyl compounds I	16.1-16.13, 16.15-16.17, 16.19-16.21, 16.23, 19.1	Ch.16#4,9,10,12,13,14,15,16,17,18,20,33,40,41 42,48,51,52,58,62. Ch.19 #2,4,6.
19	Nov.06			
20	Nov.08			
21	Nov.13	Carbonyl compounds II	17.1-17.13	Ch.17 #4,6,9,11,13,16,17,21,23,28, 29,30,32,33,38,46,47,48,51,52,53,75,79.
22	Nov.15			
23	Nov.20	Carbonyl compounds III	18.1-18.9,18.10-18.16	Ch.18 #3,5,9,16,17,20,28,29,30.
24	Nov.22	Lab Exam	Lab Operations (all)	
25	Nov.27			
26	Nov.29	Amines	20.1-20.7	Ch.20 #4,7,11.
December...		FINAL EXAM (3 h)	Cumulative	Covers entire course.

