

Chem 2223b: Organic Chemistry of Biological Molecules

Intersession 2008 Course Outline

Mandatory Notice from the Registrar: Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites. The prerequisite for this class is Chem 2213a or the former 213a/b.

Course website

- <https://instruct.uwo.ca/chemistry/223>
- Login = your Western email username without the @uwo.ca portion
- Password = your Western email password
- **Students should check the website on a regular basis for news and updates.**
Contact the ITS Support Centre on the second floor of NSC if you cannot log in.

Instructor and office hours

- Dr. Felix Lee flee32@uwo.ca Physics and Astronomy Building 224b
- Office hours are Monday through Friday, 1:45 – 2:45 PM, unless otherwise announced on website

Lecture information

- Natural Sciences Centre room 1, 9:30 AM – 12:30 PM
- A 15-minute break will be provided for everyone (included the instructor)

Course materials

- 2008 Laboratory Manual for Chemistry 223b and appropriate lab attire (see lab manual).
- No required textbook. Students may find *Introduction to Organic Chemistry*, Brown and Poon, third edition (2005), to be a useful reference for fundamental concepts from Chem 213a.
- A molecular model set is optional.

Evaluation

- The final grade for the whole course will be calculated from the following:
 - Laboratory component (3% per experiment = 15% total)
 - In-class midterm test (35%) on Thursday, June 12, 9:30 – 11:30 AM
 - Cumulative final exam (50%) scheduled by the Registrar (June 23 or 24)
- **To pass the course, one must satisfy all of the following conditions:**
 - Perform at least three of the five laboratory experiments;
 - Obtain a minimum of 7.50 out of 15.00 on the laboratory component; and
 - Obtain a minimum of 50 out of 100 in the whole course.
- Failure to complete an experiment, or write an exam, will result in a mark of zero for the missed experiment or exam, unless a valid reason has been approved by the Dean. **THERE ARE NO MAKE-UP LABS OR MIDTERM TESTS.** If you are excused from an experiment, the lab mark will be based on an average of the other experiments. Being excused from the midterm will result in a final worth 85%.
- Due to the limited choice of exam questions, students can only retain a copy of the midterm-test question booklet. The booklet for the final exam cannot be retained, and answers for final exam will not be posted.
- To ensure fairness to and equal treatment of all students, course marks will be calculated using the scheme listed above will not be adjusted on an individual basis. We do not offer supplementary tests, essays, or work of any sort to increase an individual's grades.

Important required notices

- No electronic devices (calculators, phones, etc.) are allowed on test and exams.
- Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following website: <http://www.uwo.ca/univsec/handbook/appeals/scholoff.pdf>. Computer-marked multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.
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Lab schedule

- Sections 002 and 003 run 1:30 – 4:30 PM, while 004 and 005 run 5:30 – 8:30 PM.
- All labs are in Chem Building 112. Those arriving unprepared for an experiment will receive a zero for that experiment. You are deemed unprepared if you arrive without an individually completed pre-lab, late, or in inappropriate attire. For your protection, socks, fully closed shoes, full-length pants, safety glasses, and a lab coat are required. Refer to lab manual for further details.

Monday	Tuesday	Wednesday	Thursday	Friday
June 2	3 Expt 1 Sections 3 + 5	4 Expt 1 Sections 2 + 4	5 Expt 2 Sections 3 + 5	6
9 Expt 2 Sections 2 + 4	10 Expt 3 Sections 3 + 5	11 Expt 3 Sections 2 + 4	12	13
16 Expt 4 Sections 2 + 4	17 Expt 4 Sections 3 + 5	18 Expt 5 Sections 2 + 4	19 Expt 5 Sections 3 + 5	20

Approximate class schedule

- The midterm test will cover all material up to and including the class on June 10.

Monday	Tuesday	Wednesday	Thursday	Friday
June 2 Administration	3 Colours and Chrom.	4 Amino Acids	5 Amino Acids	6 Amino Acids
9 Carbohydrates	10 Carbohydrates	11 Carbohydrates	12 Midterm 9:30 – 11:30	13 Lipids
16 Lipids	17 Lipids	18 Nucleic Acids	19 Nucleic Acids Pharm. Drugs	20 Study Day, time-permitting

Detailed breakdown of topics

1. Colours and Chromophores
 - Photophysical processes, UV/visible and fluorescence spectroscopy
2. Review of Cellular Structure and Function (self-study section; examinable material)
3. Amino Acids and Proteins
 - Acid-base properties, protein structure, composition and sequence analyses, Edman degradation, laboratory peptide synthesis, enzymes, coenzymes, biosynthesis of proteins
4. Carbohydrates
 - Stereochemistry, reactions of functional groups, properties of di- and polysaccharides, mechanisms of glycolytic reactions, connection of pyruvate to amino acids
5. Lipids
 - Properties, biosynthesis, and beta-oxidation of fatty acids, synthesis of soaps and detergents, biosynthesis of terpenes, phospholipids and membranes, fat-soluble vitamins
6. Nucleic Acids
 - Structure and properties, DNA sequencing, laboratory DNA synthesis, carcinogens
7. Pharmaceutical Drugs
 - Sources of pharmaceutical drugs, approval process, sulfanilamide, PDT

Practice problems

- Practice problems, which were compiled from previous exams, are included in the laboratory manual. Please use them with discretion. Learn the concepts involved in the course and how to apply them to problems in chemistry. Avoid learning the questions themselves. While the practice problems may provide an idea of the questions that can be asked on exams, they are only aids to help you evaluate your knowledge of and ability to apply the concepts.
- Course content varies year-to-year, and some of the problems may not be representative of the material covered in this offering.
- Answers to the practice problems will be posted on the course website. You will learn more by attempting the problems first, before looking at the answers.