

**CONCORDIA UNIVERSITY
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY**

**CHEM 426/626
REACTIVE INTERMEDIATES**

SYLLABUS – Fall 2021

GENERAL INFORMATION

Reactive Intermediates (CHEM 426/626) is a one-term course available to both senior undergraduate and graduate students. It is offered as “Advanced Topics in Chemistry” and as such requires a solid organic chemistry background. CHEM 293 (Spectroscopy of Organic Compounds) is a prerequisite, and CHEM 324 (Organic Chemistry III) and CHEM 325 (Organic Chemistry IV) are highly recommended. This course offers an introduction to reactive intermediates with an emphasis on structure and stability as found in modern (Physical) Organic Chemistry. The material covered is applicable in chemistry and biochemistry alike.

| | |
|----------------|--|
| INSTRUCTOR | Professor H.M. Muchall Office LOY SP 275.15 Tel. (514) 848-2424 x3342 (I will not return calls.) heidi.muchall@concordia.ca |
| COURSE FORMAT | Lectures |
| LECTURE HOURS | Tu/Th 10:15 – 11:30 |
| LOCATION | LOY CC 305 |
| COURSE WEBSITE | CHEM 426 2212 |
| OFFICE HOURS | Mo 14:30-15:30; drop-in “anytime”: just ask if I am available; or contact me by email |

LECTURES AND READING

There is no single textbook for this advanced course. A list of textbooks that are available in the library, some of which have been put on reserve, is suggested on Moodle, and you should consult these on the different topics covered. The lectures are designed to reinforce and clarify textbook material.

COURSE OBJECTIVES

- To provide students with an introduction to reactive intermediates as found in (organic) chemistry.
- To introduce students to the modern means of detecting and identifying reactive intermediates.
- To raise an awareness of the factors that govern structure and stability that students can apply to the reactions of reactive intermediates.

COURSE OUTLINE

- Chapter 1 Physical Background
- Chapter 2 Radicals
- Chapter 3 Carbenes
- Chapter 4 Carbocations

A detailed description with key words covered and links to the lecture slides can be found on Moodle. The slides used during class are also posted here, as pdf, for students to print and bring to class to annotate.

EXAMINATIONS

There will be two (2) formal examinations, hopefully live in-class:

- Exam 1 October 26, 2021**
- Exam 2 November 25, 2021**

If a student is absent from an exam, he/she must produce a written excuse appropriately signed (i.e., by a doctor or an employer) on the appropriate letterhead paper. This letter must be delivered to the instructor as soon as possible but **no later than one week after the exam**. The Department determines the validity of the absence. If

there is no valid excuse, the student will receive a mark of zero for the exam. When the absence is valid, a make-up exam will be offered.

CHEM 426 PROBLEM SET

There will be one (1) problem set towards the end of the course. It will have to be solved (each student on their own) and returned to the instructor **on a day to be determined**. Late submissions will not be accepted. The Problem Set will be corrected and marked.

CHEM 626 PRESENTATIONS

All CHEM 626 students are required to give a short (30 min.) presentation during a lecture period towards the end of the term. The topic will be supplied by the instructor probably at the start of October. All presentations will be preceded by an abstract and followed by a discussion period, and all students (CHEM 426 and 626) are required to participate in these.

ACADEMIC HONESTY (Source: <http://www.concordia.ca/students/academic-integrity.html>)

Go to the link above and familiarize yourself with what you are supposed to do and what you are supposed to avoid doing.

The most common offense under the Academic Code of Conduct is plagiarism, which the Code defines as “the presentation of the work of another person as one's own or without proper acknowledgement.”

“Work” here could be material copied word for word from books, journals, internet sites, professor's course notes, etc. It could be material for which the words have been changed but whose phrasing still closely resembles that of the original source. It could be the work of a fellow student, e.g., a lab report completed by another student, or unauthorized data for a lab report. It could be a paper purchased through one of the many available sources. “Plagiarism” does not refer to words alone – it also refers to images, graphs, tables and ideas. “Presentation” is not limited to written work. It also includes computer and artistic works. Finally, if you translate the work of another person into English and do not cite the source, this is also plagiarism.

In these “**internet times**”, the following are also offenses:

- for **lectures and related material**: unauthorized recordings; distribution of such material (electronically or otherwise);
- for **evaluative exercises**: use of any unauthorized material; making copies (through scans, photos, videos...) of the evaluation material, and distribution of such material.

The Academic Code of Conduct can be found in section 17.10 of the undergraduate calendar (<http://www.concordia.ca/academics/undergraduate/calendar/current/17-10.html>). Any form of cheating, unauthorized collaboration, copying or plagiarism found in this course will be reported to the Dean's office.

CHEM 101

As part of CHEM 426/626, you are **required** to attend a seminar and pass a quiz on avoiding plagiarism and other forms of academic dishonesty, offered by the Department of Chemistry and Biochemistry. If you have already attended the seminar and achieved 100 % (110 points) on the quiz **within the past five (5) years (i.e. Fall 2016 or more recently)**, you have fulfilled the requirement. 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>).

The aim of the seminar and quiz is to clarify which academic practices are considered unacceptable by the Department of Chemistry and Biochemistry. The seminar will be offered during the third week of classes (see the appendix for the dates and times offered); the quiz is online, can be accessed on Moodle (choose CHEM 101 under Specialized Chemistry Sites) and can be taken from after the seminar up to the deadline announced on the CHEM 101 site, but preferably as soon as possible. **If you do not attend the seminar and/or do not pass the quiz (the passing mark is 100 %), your course grade will be lowered by one full letter grade with an incomplete (INC) notation.** Please refer to the academic calendar section 16.3.6 on how to remove the INC and restore the proper course grade.

COURSE GRADE

The final grade of the course is based on the marks obtained in the exams and either the problem set or the presentation. The composition of the final grade is as follows:

| | |
|-------------------------|----------------|
| Exams | 80% (40% each) |
| Problem Set (CHEM 426) | 20% |
| Presentation (CHEM 626) | 20% |

The minimum passing mark is 50% (D-) for undergraduates. For graduate students, C and F rules (<http://www.concordia.ca/academics/graduate/calendar/current/academic-regulations.html>) apply.

The grading scales (percentage to letter grade) follow (normal rounding applies):

| | UGrad CHEM 426 | Grad CHEM 626 |
|--------|-------------------|------------------|
| 100-90 | A+ | A+ |
| 89-85 | A | A |
| 84-80 | A- | A- |
| 79-77 | B+ | B+ |
| 76-73 | B | B |
| 72-70 | B- | B- |
| 69-67 | C+ | C |
| 66-63 | C | |
| 62-60 | C- | |
| 59-57 | D+ | F |
| 56-53 | D | |
| 52-50 | D- | |
| <50 | F | |

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

H.M. Muchall, August 2021

Appendix**Seminar on academic conduct**

| Date (Fall 2021) | Time | Mode | Registration link |
|-------------------------|-----------------|------|--|
| Sept. 22 (Wednesday) | 21:00- 22:00 | Zoom | https://concordia-ca.zoom.us/meeting/register/tZlucumrqTouHdDujCve8eeyjRsM_6XiQUD |
| Sept. 23 (Thursday) | 21:00- 22:00 | Zoom | https://concordia-ca.zoom.us/meeting/register/tZEsdeyupjIuGNdupvk7KE33YXJ6MyAak0An |
| Sept. 27 (Monday) | 19:00- 20:00 | Zoom | https://concordia-ca.zoom.us/meeting/register/tZlud-urqTMiH91iodapd5geAi05rQtcR_y6 |

As space for each of the Zoom seminars is limited, please **register** early for your preferred evening 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 corresponding date. We will take attendance at the Zoom seminar.