

**CHEM\*4730**  
**SYNTHETIC ORGANIC CHEMISTRY**  
**(FALL SEMESTER 2015)**

**Information Sheet and Course Outline**

- **Instructor:** Professor William Tam  
Office: MacN 332      Phone: 519-824-4120 (Ext.52268)  
E-mail: wtam@uoguelph.ca  
\*\*You are welcome to come to ask me questions in my office and to discuss problems (My availability will be posted on the course website).
  
- **Lectures:** September 10 – December 3, 2015 (Tuesdays and Thursdays)  
11:30 am – 12:50 pm, MCKN 234 (McKinnon Building).
  
- **Calendar Description:** This course provides an introduction to synthetic organic chemistry, including discussion of retrosynthetic analysis, modern synthetic methods, organic reaction, and syntheses of natural products. The integration of these topics for the rational design of synthetic schemes will also be discussed.  
**Prerequisite(s):** CHEM\*3750.
  
- **Objectives:** CHEM\*4730 is an advanced Organic Synthesis course at the undergraduate level. In CHEM\*4730, the emphasis is on the understanding of the factors that control reactions and the reaction products, and design syntheses of organic molecules of moderate complexity.  
**Specific Learning Objectives:**
  - (1) To make the students knowledgeable about the fundamentals of Organic Synthesis.
  - (2) To understand the consequences (reactivity, properties) of different functional groups.
  - (3) To be able to interpret patterns of reactivity on the basis of mechanistic reasoning.
  - (4) To be able to design syntheses of organic molecules of moderate complexity.
  
- **Lecture Notes/Lecture Slides (6<sup>th</sup> Edition):**  
The lectures notes/slides for CHEM\*4730, Synthetic Organic Chemistry, will be available for download through CourseLink at the beginning of the semester. It is assumed that students are familiar with the organic chemistry materials covered in CHEM\*2700 and CHEM\*3750 and you may wish to have the notes available to review topic as needed.

- **Course Web Page:** You can access the course website through Courselink: <https://courselink.uoguelph.ca/shared/login/login.html>.  
This web page will be updated regularly. Lecture notes/slides, assignments, answer for assignments, tutorial and revision materials, past exam papers and answers, as well as exam grades and statistics will be posted. Please visit this website regularly, especially before exams.
- **Useful General Reference Books:**
  - (a) “*Advanced Organic Chemistry, Part A and Part B*”, 4<sup>th</sup> or 5<sup>th</sup> Ed., by Carey, F. A. and Sundberg, R. J., Kluwer Academic/Plenum Publishers (4<sup>th</sup> Ed.) or Springer Publishers (5<sup>th</sup> Ed.).
  - (b) “*Organic Synthesis*”, 2<sup>nd</sup> Edition, by Smith, M. B., McGraw-Hill Companies, Inc., New York, 2002.
  - (c) “*March’s Advanced Organic Chemistry*”, 5<sup>th</sup> or 6<sup>th</sup> Ed., by Smith M. B. and March, J., John Wiley and Sons, Inc., New York, 2001 and 2007.
  - (d) “*Classics in Total Synthesis*”, by Nicolaou, K. C. and Sorensen, E. J., VCH Publishers, Inc., New York, 1996.
  - (e) “*The Logic of Chemical Synthesis*”, by Corey, E. J. and Cheng, X. M., John Wiley and Sons, Inc., New York, 1989.
- **Communications:** The primary communication between the students and the lecturer concerning issues with the course is through discussions during the lectures (e.g. exams and quizzes coverage, due dates for quizzes, and other announcements related to the course). Although most of the time, announcements and information related to the course will also be posted on CourseLink and/or e-mails to the students, **students are expected to attend EVERY lecture**. This is NOT a DE course. If you miss a lecture, make sure you talk to your classmate to see if there is any important announcement during the lecture that you missed or you are welcome to contact me by phone or e-mail.  
**E-mail Communication:** As per university regulations, all students are required to check their <mail.uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.
- **When You Cannot Meet a Course Requirement:** When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the undergraduate calendar for information on regulations and procedures for Academic Consideration:  
<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>
- **Drop Date:** The last date to drop one-semester courses, without academic penalty, is Friday, **November 6, 2015 (the fortieth class day)**. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar:  
<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

- **Accessibility:** The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Student Accessibility Services as soon as possible.  
For more information, contact SAS at 519-824-4120 ext. 56208 or email [csd@uoguelph.ca](mailto:csd@uoguelph.ca) or see the website: <http://www.uoguelph.ca/csd/>
- **Academic Misconduct:** The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.  
Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.  
The Academic Misconduct Policy is detailed in the Undergraduate Calendar:  
<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>
- **Recording of Materials:** Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.
- **Resources:** The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs: <http://www.uoguelph.ca/registrar/calendars/index.cfm?index>
- **Assignments:** Problem sets (1-6) and solutions to the problems are posted on the course website.

- **Mark Distribution:** The final grade will be obtained as follows:

Quiz 1 (in class):	<b>5%</b>	(Date: Sept. 22, 2015, Coverage: Chapter 1 only)
Quiz 2 (in class):	<b>5%</b>	(Date: Oct. 6, 2015, Coverage: Chapters 1 and 2)
Quiz 3 (in class):	<b>5%</b>	(Date: Nov. 3, 2015, Coverage: Chapters 1–5)
1 <sup>st</sup> Midterm Exam.:	<b>20%</b>	(Date: Oct. 23, 2015, Friday, Time: 5:30pm – 7:00pm Location: CRSC 116, Coverage: Ch. 1-3)
2 <sup>nd</sup> Midterm Exam.:	<b>20%</b>	(Date: Nov. 16, 2015, Monday, Time: 5:30pm – 7:30pm, Location: CRSC 116, Coverage: Ch. 1-6)
Term Paper:	<b>15%</b>	(Due date: November 26, 2015)
Final Exam:	<b>30%</b>	(Date: Dec. 12, 2015, Saturday, Time: 2:30pm – 4:30pm, Location: TBA. Coverage: Chapters 1-9)

**\*\*If you missed an exam or a quiz, or did not hand in your term paper by the due date, you will obtain a 0% of that component, unless for special reasons like medical issues or compassionate reasons which had been communicated with me before the exam/quiz or due date.**

**\*\*Note that EVERY student in class MUST write three quizzes, two mid-term exams and one final exam: there is no exception. If you missed an exam because of a medical reason, you will need to write a make-up exam as soon as you are recovered. Re-weighting the percentages of the exams will not be allowed.**

**\*\*Do not make any request to make changes to the weighting of each exam (e.g. some students in the past who did poorly in a mid-term exam, requested to change the mark distribution and to move certain percentage of a mid-term exam to the final exam). Once the distribution of marks from different components (e.g. mid-terms, quizzes and final exam) to calculate the final grade has been posted on the course outline, instructors are not supposed to make ANY changes to the final grade calculation method. The same method of evaluation and the same distribution of marks MUST be used for ALL the students in the same class, otherwise it would not be fair to other students.**

### **Topics to be covered in CHEM\*4730**

- Chapter 1: Review on Basic Organic Reactions & Functional Groups Transformations
- Chapter 2: Oxidation
- Chapter 3: Reduction
- Chapter 4: Olefination
- Chapter 5: Introduction to Protecting Groups in Organic Synthesis
- Chapter 6: Functional Groups Interconversion
- Chapter 7: Cycloaddition
- Chapter 8: Palladium Catalyzed Coupling Reactions
- Chapter 9: Case Study in Total Synthesis of Natural Products

## CHEM\*4730 Tentative Lectures and Exams Schedules (2015F)

Class Day	Date		Estimated Coverage	Class Day	Date		Estimated Coverage
1	Sept	10 (Th)	Chapter 1	13	Oct.	27 (Tue)	Chapters 4 and 5
2		15 (Tue)	Chapter 1	14		29 <sup>c</sup> (Th)	Chapter 5
3		17 (Th)	Chapter 1	15	Nov.	3 (Tue)	<b>QUIZ 3</b> ; Chapter 6
4		22 <sup>a</sup> (Tue)	<b>QUIZ 1</b> ; Chapter 2	16		5 <sup>§</sup> (Th)	Chapter 6
5		24 (Th)	Chapter 2	17		10 <sup>d</sup> (Tue)	Tutorial & Revision
6		29 (Tue)	Chapters 2	18		12 (Th)	Tutorial & Revision
7	Oct <sup>†</sup>	1 (Th)	Chapter 3			<b>16 (Mon)</b>	<b>2<sup>nd</sup> Mid-term Exam</b>
8		6 (Tue)	<b>QUIZ 2</b> ; Chapter 3	19		17 (Tue)	Chapter 7
9		8 <sup>b</sup> (Th)	Chapter 3	20		19 (Th)	Chapters 7 and 8
10		15 (Th)	Tutorial & Revision	21		24 (Tue)	Chapter 8
11		20 (Tue)	Tutorial & Revision	22	26 <sup>e</sup> (Th)	Chapter 9	
12		22 (Th)	Chapter 4	23	1 (Tue)	Tutorial & Revision	
		<b>23 (Fri)</b>	<b>1<sup>st</sup> Mid-term Exam</b>	24	3 (Th)	Tutorial & Revision	
<sup>†</sup> No class scheduled on Oct. 13 <sup>th</sup> (Tue) – Fall Study Break Day – classes rescheduled to Thurs., Dec. 3. <sup>§</sup> November 6 <sup>th</sup> (Fri.): 40 <sup>th</sup> class day, last day to drop the course <b>1<sup>st</sup> Midterm Exam.: Fri. Oct. 23<sup>rd</sup> (Time: 5:30pm – 7:00pm, Location: CRSC 116)</b> <b>2<sup>nd</sup> Midterm Exam.: Mon. Nov. 16<sup>th</sup> (Time: 5:30pm – 7:30pm, Location: CRSC 116)</b> <b>Final Exam: Dec. 12, 2015, Saturday, Time: 2:30pm – 4:30pm, Location TBA</b>							

<sup>a</sup>Complete Assignments 1 and 2.

<sup>b</sup>Complete Assignment 3.

<sup>c</sup>Complete Assignment 4: Que 1 (i, iv, v, vi, vii, viii), 2, 3 (i-v, vii).

<sup>d</sup>Complete Assignment 4: omit Que 1 (x, xi) and Que 3 (ix).

<sup>e</sup>Complete Assignments 4 – 6 .