CBMS791

Research Topic: Advanced Organic Chemistry

S1 Day 2015

Dept of Chemistry & Biomolecular Sciences

Contents

General Information

Unit convenor and teaching staff
Unit Convenor
Fei Liu
fei.liu@mq.edu.au
Contact via fei.liu@mq.edu.au
F7B 330
Students are encouraged to arrange a meeting via email.

Credit points
4

Prerequisites
Admission to MRes

Corequisites

Co-badged status

Unit description
This unit comprises study of an advanced topic in chemistry and biomolecular sciences. The area studied each year is tailored to the current student cohort. Emphasis is put on both the understanding of advanced concepts as well as their application in problem-solving and/or research environments. This unit provides the students with advanced and contemporary knowledge in the broad discipline of organic chemistry and focuses on topics that describe modern theories and practices in this area. As the control of changing forms of matter lies at the heart of chemistry, this unit will examine the principles of change in more complex systems and quantitative terms that are appropriate to graduate level studies. The molecular insight developed in this course will prepare students for creative research in basic and applied organic chemistry or interface fields. Topics may include but are not limited to: advanced structural chemistry and methods; mechanistic models and characterisation; advanced synthesis and catalysis; biomimetic processes and materials; molecular assemblies; reactive intermediates; and properties.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

Describe and outline modern theories and methods for understanding and analysing molecular structure and reactivity;
Identify the scope and limitation of existing theories and methods;
Explain observed reactivity given structural information;
Predict for likely mechanisms given starting structures and conditions and suggest appropriate methods of characterisation;
Propose combinations of mechanisms appropriate for controlling complex reactive intermediates;
Analyse quantitatively relationships between molecular structure and reactivity;
Comprehend primary literature such as journals and reviews and evaluate conclusions with constructive criticism;
Develop oral presentation skills for effective communication of mechanistic analysis and structural characterisation

Assessment Tasks

Name	Weighting	Due
Final Exam	40%	Exam period
Problem sets	45%	TBA
Oral presentations	15%	Usually weeks 4, 8, 12

Final Exam

Due: **Exam period**
Weighting: **40%**

The final exam will be 3 hours in length with 10 minutes reading time. It will contain questions involving short answers and calculations.

On successful completion you will be able to:

- Describe and outline modern theories and methods for understanding and analysing molecular structure and reactivity;
- Identify the scope and limitation of existing theories and methods;
- Explain observed reactivity given structural information;
- Predict for likely mechanisms given starting structures and conditions and suggest appropriate methods of characterisation;
- Propose combinations of mechanisms appropriate for controlling complex reactive

intermediates;
- Analyse quantitatively relationships between molecular structure and reactivity;
- Comprehend primary literature such as journals and reviews and evaluate conclusions with constructive criticism;

Problem sets

Due: **TBA**
Weighting: **45%**

7 problem sets in total; answering these problem sets involve providing short answers and calculations with literature searches. These will be provided in class or via the unit web page.

On successful completion you will be able to:
- Describe and outline modern theories and methods for understanding and analysing molecular structure and reactivity;
- Identify the scope and limitation of existing theories and methods;
- Explain observed reactivity given structural information;
- Predict for likely mechanisms given starting structures and conditions and suggest appropriate methods of characterisation;
- Propose combinations of mechanisms appropriate for controlling complex reactive intermediates;
- Analyse quantitatively relationships between molecular structure and reactivity;
- Comprehend primary literature such as journals and reviews and evaluate conclusions with constructive criticism;

Oral presentations

Due: **Usually weeks 4, 8, 12**
Weighting: **15%**

3 in total, ~20 minutes each for presenting on research of primary literature and critical analysis of results on a given topic. The student seminars will be presented in the tutorial sessions in normally weeks 4, 8 and 12 unless stated otherwise. Attendance and participation will be part of the assessment mark.

On successful completion you will be able to:
- Develop oral presentation skills for effective communication of mechanistic analysis and structural characterisation

Delivery and Resources

Lectures will be in weeks 1-12 (F7B322, Wednesday 5-6 pm; tentative and subject to change).

12 tutorials, each 2 hours, will be conducted from weeks 2-13 (more details later). In week 13 there will be an additional review tutorial of 2 hours.

Lectures will be presented as a combination of formal lectures and interactive Q&A discussions. Some lecture material will be available on the unit web site, while other material will be provided in the lecture class. At the graduate level, the students are expected to demonstrate a high level of independence in their learning. This means reading the required materials (and beyond), searching in primary literature, working through problems outside of lectures. Working on the assignment questions with peer consultation is permitted; however, individualised thought processes must be clearly demonstrated. In the tutorials the students will present their seminars on assigned topics. All students will be expected to participate in discussions.

The main source of materials will be from the primary literature (i.e. journal articles, reviews, and sections of research books). Francis A. Carey and Richard J. Sundberg's Advanced Organic Chemistry A&B is the recommended text and an electronic copy of this can be downloaded from ilearn or the library's web site. This text should be used as a reference or background source for the topics discussed.

Students are expected to use iLearn and access the web pages regularly for announcements, relevant links downloadable course material, and other supporting information. The staff will be available for consultations in person after an appointment has been made via email.

The offer this year is similar to the year before with minor changes of content according to the most current primary literature. In 2014 there were 7 assignments (10 in 2013).

Unit Schedule

The main source of materials will be from the primary literature (i.e. journal articles, reviews, and sections of research books). Francis A. Carey and Richard J. Sundberg's Advanced Organic Chemistry A is the recommended text and provides a general indication of topics of covered and the order of coverage.

Learning and Teaching Activities

Lectures

The theory associated with the unit content is presented

Tutorial sessions

Students work through problems (that are simliar to those encountered in examinations associated with the content of the relevent module

Presentations

Students provide literature reviews and their critical analyses

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy.html

Grading Policy http://mq.edu.au/policy/docs/grading/policy.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://informatics.mq.edu.au/help/.

When using the University's IT, you must adhere to the Acceptable Use Policy. The policy applies to all who connect to the MQ network including students.