



# MOLS7053

## Research Topic: Advanced Organic Chemistry

Session 1, Weekday attendance, North Ryde 2021

*Department of Molecular Sciences*

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#### Disclaimer

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#### Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group activities on campus, and most will keep an online version available to those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

## General Information

Unit convenor and teaching staff

Unit Convenor/Lecturer

Fei Liu

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4WW 330

Students are encouraged to arrange a meeting via email.

Lecturer

Peter Karuso

[peter.karuso@mq.edu.au](mailto:peter.karuso@mq.edu.au)

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Lecturer

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4WW 231

Students are encouraged to arrange a meeting via email.

Lecturer

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4WW 123

Students are encouraged to arrange a meeting via email.

Credit points

10

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 change forms the heart of chemistry, this unit will examine the principles of change in more complex systems and in 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://students.mq.edu.au/important-dates>

## Learning Outcomes

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

- ULO1:** Propose mechanisms of multicomponent reactions given the starting materials and reagent or reagent and product
- ULO2:** Describe and outline modern theories and methods for understanding and analysing molecular structure and reactivity
- ULO3:** Demonstrate an understanding of key molecular design and control principles in reactive intermediates/pathways and their applications in materials, catalysis, and pharmaceutical research
- ULO4:** Demonstrate how to use small molecules to construct and interrogate complex chemical or biological systems
- ULO5:** Critically analyse primary literature such as journals and reviews and evaluate conclusions with constructive criticism
- ULO6:** Demonstrate oral presentation skills for effective communication of mechanistic analysis and structural characterisation

## General Assessment Information

Assessment is based on assignments/workshops/presentations. These assessment tasks are provided so that you will have the opportunity to use the information gained in the lectures/

tutorials to test your degree of understanding of those topics and to gain discipline specific knowledge, problem solving skills, critical literature analysis as well as develop your own independent thinking. **There is no final exam for this unit.**

**If you miss a class/tutorial or are late for completing an assessment due to illness or misadventure, you are required to** 1) submit a request for special consideration no later than five (5) working days after the due date and 2) email the lecturer in charge of the topic and the Unit Convenor.

Please find further information on Special Consideration here: <https://students.mq.edu.au/study/my-study-program/special-consideration>

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Oral presentations</a>	36%	No	Weeks 4, 7, 10, 13
<a href="#">Workshops</a>	24%	No	weeks 3, 5, 6, 8, 9, 12; details on iLearn
<a href="#">Assignments</a>	40%	Yes	weeks 2, 3, 5, 6, 8, 9, 11,12; details on iLearn

### Oral presentations

Assessment Type <sup>1</sup>: Presentation

Indicative Time on Task <sup>2</sup>: 40 hours

Due: **Weeks 4, 7, 10, 13**

Weighting: **36%**

Four 20 minute presentations on research from primary literature and critical analysis of results on a given topic.

On successful completion you will be able to:

- Propose mechanisms of multicomponent reactions given the starting materials and reagent or reagent and product
- Demonstrate an understanding of key molecular design and control principles in reactive intermediates/pathways and their applications in materials, catalysis, and pharmaceutical research
- Demonstrate how to use small molecules to construct and interrogate complex chemical or biological systems
- Critically analyse primary literature such as journals and reviews and evaluate conclusions with constructive criticism
- Demonstrate oral presentation skills for effective communication of mechanistic analysis

and structural characterisation

## Workshops

Assessment Type <sup>1</sup>: Quantitative analysis task

Indicative Time on Task <sup>2</sup>: 34 hours

Due: **weeks 3, 5, 6, 8, 9, 12; details on iLearn**

Weighting: **24%**

Six workshop tasks with discussion forums on literature topics

On successful completion you will be able to:

- Propose mechanisms of multicomponent reactions given the starting materials and reagent or reagent and product
- Describe and outline modern theories and methods for understanding and analysing molecular structure and reactivity
- Demonstrate an understanding of key molecular design and control principles in reactive intermediates/pathways and their applications in materials, catalysis, and pharmaceutical research

## Assignments

Assessment Type <sup>1</sup>: Problem set

Indicative Time on Task <sup>2</sup>: 40 hours

Due: **weeks 2, 3, 5, 6, 8, 9, 11,12; details on iLearn**

Weighting: **40%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

8 Assignment sets in total; answering 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:

- Propose mechanisms of multicomponent reactions given the starting materials and reagent or reagent and product
- Describe and outline modern theories and methods for understanding and analysing molecular structure and reactivity
- Demonstrate an understanding of key molecular design and control principles in reactive intermediates/pathways and their applications in materials, catalysis, and pharmaceutical research
- Demonstrate how to use small molecules to construct and interrogate complex chemical or biological systems

<sup>1</sup> If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Learning Skills Unit](#) for academic skills support.

<sup>2</sup> Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

## Delivery and Resources

Lectures will be in weeks 1-12. Tutorials/workshops will be conducted from weeks 2-13 (please contact each lecturer for more details).

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/workshops 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 offering this year is similar to the year before with some changes of specific topics drawn from the current primary literature.

## Unit Schedule

Please visit the iLearn website for details.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)

- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies](https://students.mq.edu.au/support/study/policies) (<https://students.mq.edu.au/support/study/policies>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>) and use the [search tool](#).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

## Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) 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](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@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](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## Student Enquiry Service

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Equity 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.

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.