



MOLS7053

Research Topic: Advanced Organic Chemistry

Session 1, In person-scheduled-weekday, North Ryde 2023

School of Natural Sciences

Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	3
<u>General Assessment Information</u>	3
<u>Assessment Tasks</u>	4
<u>Delivery and Resources</u>	6
<u>Unit Schedule</u>	7
<u>Policies and Procedures</u>	7

Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff

Lecturer/Unit convenor

Fei Liu

fei.liu@mq.edu.au

Contact via [Contact via fei.liu@mq.edu.au](mailto:fei.liu@mq.edu.au)

4WW 330

[Make an appointment](#)

Lecturer

Joanne Jamie

joanne.jamie@mq.edu.au

Contact via [Contact via joanne.jamie@mq.edu.au](mailto:joanne.jamie@mq.edu.au)

4WW 231

[Make an appointment](#)

Lecturer

Koushik Venkatesan

koushik.venkatesan@mq.edu.au

Contact via [Contact via Koushik.venkatesan@mq.edu.au](mailto:koushik.venkatesan@mq.edu.au)

4WW 123

[Make an appointment](#)

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://www.mq.edu.au/study/calendar-of-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

Hurdle Activities

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 class to test your degree of understanding of those topics and to integrate 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.**

As indicated in the assessment section, assignments are the hurdle activities as they are essential to the learning outcomes. A passing grade in this hurdle (as average of all of the assignment grades) is required to pass the unit. You must consult with the unit convenor for options if you are issues with the hurdle activities.

General Faculty Policy on assessment submission deadlines and late submissions:

Late submissions generally will not be accepted unless with approved special consideration for extended due dates. Only the oral presentations will be submitted online, and the submission dates will be provided on iLearn while the submission time for all uploaded assessments university-wide is **11:55 pm**. A 1-hour grace period will be provided to students who experience a technical concern. If you 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 to discuss options.

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
<u>Oral presentations</u>	36%	No	Weeks 4, 7, 10, 13; details on iLearn
<u>Assignments</u>	40%	Yes	Weeks 2, 3, 5, 6, 8, 9, 11,12; details on iLearn
<u>Workshops</u>	24%	No	Weeks 2, 3, 5, 6, 8, 9, 11,12; details on iLearn

Oral presentations

Assessment Type ¹: Presentation

Indicative Time on Task ²: 40 hours

Due: **Weeks 4, 7, 10, 13; details on iLearn**

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

Assignments

Assessment Type ¹: Problem set

Indicative Time on Task ²: 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

Workshops

Assessment Type ¹: Quantitative analysis task

Indicative Time on Task ²: 34 hours

Due: **Weeks 2, 3, 5, 6, 8, 9, 11,12; 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

¹ 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 [Writing Centre](#) for academic skills support.

² 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

Classes in Week 1

Lectures will be in weeks 1-12. Workshops will be conducted from weeks 2-13 (please contact each lecturer for more details). ?Off-shore students must email the convenor as soon as possible to discuss options if week 1 class/participation is missed or delayed. ?

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.

Methods of communication

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 topics in this unit focus on discoveries and developments drawn from the current primary literature around reactive intermediates in carbon-based molecules. Please see the unit's iLearn website for up-to-date details.

Covid

For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie website: <https://www.mq.edu.au/about/coronavirus-faqs>. Remember to check this page regularly in case the information and requirements change during semester. If there are any changes to this unit in relation to COVID, these will be communicated via iLearn along.

Unit Schedule

The topics in this unit focus on discoveries and developments drawn from the current primary literature around reactive intermediates in carbon-based molecules. Please see the unit's iLearn website for up-to-date 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](#)
- [Assessment Procedure](#)
- [Complaints Resolution 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 or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

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

The Writing Centre

[The Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the 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 Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault

- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit 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.