



# MOLS7053

## Research Topic: Advanced Organic Chemistry

Session 1, In person-scheduled-weekday, North Ryde 2022

*School of Natural Sciences*

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## General Information

Unit convenor and teaching staff

Unit Convenor/Lecturer

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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://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

### General Faculty Policy on assessment submission deadlines and late submissions:

Online quizzes, in-class activities, or scheduled tests and exam must be undertaken at the time

indicated in the unit guide. Should these activities be missed due to illness or misadventure, students may apply for Special Consideration.

All other assessments must be submitted by 5:00 pm on their due date. Should these assessments be missed due to illness or misadventure, students should apply for Special Consideration.

Assessments not submitted by the due date will receive a mark of zero **unless** late submissions are specifically allowed as indicated in the unit guide or on iLearn.

If late submissions are permitted as indicated in the unit guide or on iLearn a consistent penalty will be applied for late submissions as follows:

A 12-hour grace period will be given after which the following deductions will be applied to the awarded assessment mark: 12 to 24 hours late = 10% deduction; for each day thereafter, an additional 10% per day or part thereof will be applied until five days beyond the due date. After this time, a mark of zero (0) will be given. For example, an assessment worth 20% is due 5 pm on 1 January. Student A submits the assessment at 1 pm, 3 January. The assessment received a mark of 15/20. A 20% deduction is then applied to the mark of 15, resulting in the loss of three (3) marks. Student A is then awarded a final mark of 12/20.

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

## 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

## 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 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

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<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 [Writing Centre](#) 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

### COVID Information and on-campus classes

On-campus teaching continues to be scheduled for Session 1, 2022. Masks are compulsory for all classes in indoor spaces and social distancing will be implemented wherever possible. Students will also be required to sanitise surfaces before and after use.

Students are requested to minimise the risk of spreading COVID to themselves and others in accordance with the university and NSW Health guidelines: <https://www.mq.edu.au/about/corona-virus-faqs> and <https://www.nsw.gov.au/covid-19/stay-safe>.

**Off-shore students** Off-shore students must email the convenor as soon as possible to discuss study options.

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 offer 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](#)
- [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](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)

## 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 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/](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.

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Unit information based on version 2022.02 of the [Handbook](#)