



MOLS3910

Advanced chemistry and Biomolecular Science III

Session 2, Infrequent attendance, North Ryde 2020

Department of Molecular Sciences

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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 learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online 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

Peter Karuso

peter.karuso@mq.edu.au

Contact via 8290

4WW 232

Credit points

10

Prerequisites

(MOLS2910 or CBMS188) and permission by special approval

Corequisites

Co-badged status

Unit description

This third unique unit in the BAdvSc degree offers extended insight into unifying core principles of the molecular sciences. Alternate years will focus the concepts of 'structure/reactivity' and 'function' that permeate nearly all aspects of the molecular sciences - from atomic to cellular interactions (odd years); to reactions and change (even years). The unit will comprise of advanced topics in chemistry and biomolecular sciences in the fields of physical, organic and inorganic chemistry, biochemistry, molecular biology, and biotechnology that emphasise either structure/reactivity (even years) or function (odd years). This advanced coursework is complemented by practical sessions providing you with advanced laboratory skills in chemistry and biology.

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: Relate how to transform one molecule into another using chemical and/or biomolecular catalysis and perform this transformation in the laboratory.

ULO2: Deduce the structure of molecules using a combination of their physicochemical properties and a variety of spectroscopic techniques.

ULO3: Assess the risks and hazards associated with working in a laboratory environment and satisfactorily complete a full risk assessment of an experimental procedure.

ULO4: Write and critique a laboratory report in a scientific format.

ULO5: Demonstrate advanced laboratory skills necessary for research in chemistry and the biomolecular sciences.

ULO6: Demonstrate collegial behaviour and mentoring ability through the guidance of junior advanced sciences students in laboratory and literature-based projects.

General Assessment Information

Mentoring

Due: **week 13** Weighting: **15%**

Mentor MOLS1910 students in 3 modules

Research Report

Due: **week 8** Weighting: **55%** This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)

Write a report on your 4 week research attachment in the form a research paper using a journal template of your choice (Tetrahedron Letters template provided on iLearn as an example)

Supervisor Assessment

Due: **End of S1** Weighting: **30%**

Supervisor to write a report and grade your laboratory work based on a template.

SciFinder Scholar

Due: **Week 1, S2** Weighting: **0%**

Mentor MOLS1910 students in learning the use of SciFinder

Assessment Tasks

Name	Weighting	Hurdle	Due
Lab report 1	50%	Yes	Week 8
Supervisor's report	35%	No	Week 12

Name	Weighting	Hurdle	Due
mentoring	15%	No	Week 13

Lab report 1

Assessment Type ¹: Lab report

Indicative Time on Task ²: 12 hours

Due: **Week 8**

Weighting: **50%**

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

Lab report 1

On successful completion you will be able to:

- Relate how to transform one molecule into another using chemical and/or biomolecular catalysis and perform this transformation in the laboratory.
- Deduce the structure of molecules using a combination of their physicochemical properties and a variety of spectroscopic techniques.
- Assess the risks and hazards associated with working in a laboratory environment and satisfactorily complete a full risk assessment of an experimental procedure.
- Write and critique a laboratory report in a scientific format.

Supervisor's report

Assessment Type ¹: Viva/oral examination

Indicative Time on Task ²: 8 hours

Due: **Week 12**

Weighting: **35%**

research results presentation to peers and supervisor with oral examination

On successful completion you will be able to:

- Write and critique a laboratory report in a scientific format.
- Demonstrate advanced laboratory skills necessary for research in chemistry and the biomolecular sciences.

mentoring

Assessment Type ¹: Participatory task

Indicative Time on Task ²: 6 hours

Due: **Week 13**

Weighting: **15%**

mentoring MOLS1910 students

On successful completion you will be able to:

- Demonstrate advanced laboratory skills necessary for research in chemistry and the biomolecular sciences.
- Demonstrate collegial behaviour and mentoring ability through the guidance of junior advanced sciences students in laboratory and literature-based projects.

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

no required text. Background reading will be required for the laboratory attachment so contact your lab supervisor well before the attachment.

lectures

34 lecture/discussion groups

workshop

teach first-years how to use SciFinder Scholar

lab attachment

4 weeks full-time supervised research

Unit Schedule

Please see the MOLS1910 iLearn site for unit schedule. You are required to attend all MOLS1910 lectures in S1 and S2:

Semester 1

Week 1 - Introduction

Week 2 - Advice from Previous Graduates

Week 3 - Molecular Visualisation

Week 4 - SciFinder Scholar training

Week 5 - Nobel Prize 2019

Week 6 - From Research to Application

Week 7 - Think Outside the Box

Section 1 (Weeks 8-13) Chirality

Semester 2 Section 2 (S2 Weeks 1-2) - Sugar Chemistry

Week 1 - Sugar Chemistry

Week 2 - Sugar Chemistry

Section 3 (Weeks 3-4) - Structure and Bonding

Week 3 - Molecular Interactions

Week 4 - Molecular Recognition and Systems

Section 4 (Weeks 5-7) - Complexity and Chemical Diversity

Week 5 - Complexity and Emergence

Week 6 - Combinatorial Chemistry

Week 7 - Multicomponent Reactions

Section 5 (weeks 8-10) - Spectroscopy

Week 8 - Introduction and Electronic Spectroscopy

Week 9 - Spectroscopy - Fluorescence

Week 10 - Spectroscopy - Vibrational and Rotational Spectroscopy

Section 6 (Weeks 11-13) - Chemical Gardens: Colour and Movement

Week 11 - Chemical Gardens

Week 12 - Chemical Gardens

Week 13 - Chemical Gardens

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>). 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](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

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

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/study/getting-started/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

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 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 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

If you are a Global MBA student contact globalmba.support@mq.edu.au

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.