



MOLS7051

Research Topic: Advanced Physical and Analytical Chemistry

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

School of Natural Sciences

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General Information

Unit convenor and teaching staff

Convenor

Ian Jamie

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Contact via 9850 8293

4WW 236

Drop in

Credit points

10

Prerequisites

Admission to MRes

Corequisites

Co-badged status

Unit description

This unit will build on fundamental concepts in physical and analytical chemistry to explore themes emerging in the field of chemistry and its global impacts. It will connect the underpinning physical chemistry topics (e.g., spectroscopy, quantum chemistry, kinetics) to the application methods employed by analytical chemistry. Topics to be covered will be determined by negotiation between staff and students. Exemplars of current applications of physical and analytical chemistry include the global impacts of, for instance, greenhouse gas detection and quantification, distribution of persistent organic pollutants, and the determination of the structures of novel nanomaterials.

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: discuss, in a coherent manner, aspects of principles and concepts of current research areas of physical and analytical chemistry.

ULO2: illustrate, in written and oral presentations, methodologies used in current advanced research in physical and analytical chemistry and their applications and

limitations

ULO3: critically analyse concepts in the primary literature relevant to current advances in physical and analytical chemistry.

ULO4: convey to an audience the role of physical and analytical chemistry in addressing current research topics in the chemistry and related disciplines.

General Assessment Information

Assessment is based on assignments, workshops and 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.

To pass this unit you must achieve a mark of 50% or greater averaged over the assessment tasks,

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. Submission dates will be provided on iLearn. 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
Problem sets	40%	No	
Literature Review	30%	No	
Oral presentations	30%	No	

Problem sets

Assessment Type ¹: Quantitative analysis task

Indicative Time on Task ²: 54 hours

Due:

Weighting: **40%**

Workshops and assigned question sets which involve providing short answers and calculations, relating to the topics being covered.

On successful completion you will be able to:

- discuss, in a coherent manner, aspects of principles and concepts of current research areas of physical and analytical chemistry.
- illustrate, in written and oral presentations, methodologies used in current advanced research in physical and analytical chemistry and their applications and limitations
- critically analyse concepts in the primary literature relevant to current advances in physical and analytical chemistry.
- convey to an audience the role of physical and analytical chemistry in addressing current research topics in the chemistry and related disciplines.

Literature Review

Assessment Type ¹: Report

Indicative Time on Task ²: 40 hours

Due:

Weighting: **30%**

A literature review on a chosen topic in physical or analytical chemistry.

On successful completion you will be able to:

- discuss, in a coherent manner, aspects of principles and concepts of current research areas of physical and analytical chemistry.
- illustrate, in written and oral presentations, methodologies used in current advanced research in physical and analytical chemistry and their applications and limitations
- critically analyse concepts in the primary literature relevant to current advances in physical and analytical chemistry.
- convey to an audience the role of physical and analytical chemistry in addressing current research topics in the chemistry and related disciplines.

Oral presentations

Assessment Type ¹: Presentation

Indicative Time on Task ²: 30 hours

Due:

Weighting: **30%**

Two presentations on topics from the primary literature.

On successful completion you will be able to:

- discuss, in a coherent manner, aspects of principles and concepts of current research areas of physical and analytical chemistry.
 - illustrate, in written and oral presentations, methodologies used in current advanced research in physical and analytical chemistry and their applications and limitations
 - critically analyse concepts in the primary literature relevant to current advances in physical and analytical chemistry.
 - convey to an audience the role of physical and analytical chemistry in addressing current research topics in the chemistry and related disciplines.
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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

The unit will be run as weekly semi-structured workshops, based around readings, task completion and problem sets, commencing in Week 1.

The main source of materials will be from the primary literature (i.e. journal articles, reviews, and sections of research books).

Unit Schedule

To be determined in consultation with students

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](#).

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/coronavirus-faqs> and <https://www.nsw.gov.au/covid-19/stay-safe>.

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.