



MOLS7051

Research Topic: Advanced Physical and Analytical Chemistry

Session 1, Weekday attendance, North Ryde 2021

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 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

Ian Jamie

ian.jamie@mq.edu.au

Contact via 02 9850 8293

4WW 236

Open hours

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://students.mq.edu.au/important-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.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Problem sets</u>	40%	No	Week 4, Week 8, Week 11
<u>Oral presentations</u>	30%	No	Week 6 and Week 12
<u>Literature Review</u>	30%	No	Week 13

Problem sets

Assessment Type **1**: Quantitative analysis task

Indicative Time on Task **2**: 54 hours

Due: **Week 4, Week 8, Week 11**

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.

Oral presentations

Assessment Type **1**: Presentation

Indicative Time on Task **2**: 30 hours

Due: **Week 6 and Week 12**

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.

Literature Review

Assessment Type ¹: Report

Indicative Time on Task ²: 40 hours

Due: **Week 13**

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.

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 [Learning Skills Unit](#) 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

Lectures/tutorials will be of 2 hour duration, held weekly. Lectures/tutorials will be presented as a combination of formal lectures and interactive discussion sessions. Students in this unit are expected to demonstrate a high level of self-directed learning. This means reading the required materials (and beyond), searching in primary literature, working through problems outside of lectures. Working through the material with your peers is encouraged. In the tutorials the students will present their seminars on assigned topics and all students will be expected to participate in discussions.

There is no recommended text for this unit. The main source of materials will be from the primary literature (i.e. journal articles, reviews, and sections of research books). Examples of starting points are the journals "*Annual Review of Analytical Chemistry*" and "*Annual Review of Physical Chemistry*",

Students are expected to check the iLearn pages regularly for announcements, relevant links downloadable course material, and other supporting information. The staff will be available for consultations in person.

Unit Schedule

The topics and schedule will be determined through discussion with the class.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.s.mq.edu.au\)](https://policies.s.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 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 Enquiry Service

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

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/.

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.