



CHEM2201

Analysis and Measurement

Session 2, In person-scheduled-weekday, North Ryde 2022

School of Natural Sciences

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General Information

Unit convenor and teaching staff

Unit Convenor

Su Su Thae Hnit

susuthae.hnit@mq.edu.au

Contact via Email

4WW-220

Monday to Friday by appointment

Lecturer

Ian Jamie

ian.jamie@mq.edu.au

Contact via Email

4WW-236

Open door

Credit points

10

Prerequisites

(CHEM1001 or CBMS107 or CBMS103) and (CHEM1002 or CBMS108 or CBMS101 or CBMS102)

Corequisites

Co-badged status

CHEM6201

Unit description

Analysis and measurement of the molecular composition and structure of matter is widely conducted in research and industry. Understanding the principles of molecular analysis and measurement is an essential part of any scientist's education. Molecular analysis involves separating molecules, measuring the molecular reaction rate (kinetics), determining identity, concentration and properties of analytes. This unit introduces the basic principles and approaches to undertake measurements of samples from across the chemical, biomolecular, microbiology and medical disciplines. Student will develop knowledge through lectures, tutorials, workshops and practicals, and gain hands-on experience with instrumentation used to make measurements and conduct analyses. The unit is a core component for students majoring in chemical and biomolecular sciences.

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: Demonstrate an understanding of the concepts of molecular analysis and measurement in the molecular sciences.

ULO2: Explain the principles of a range of techniques used for the analysis and measurement employed in the molecular sciences.

ULO3: Apply quantitative analysis methods and statistical techniques for the collection and analysis of data relevant to the molecular sciences.

ULO4: Develop intermediary chemistry laboratory skills and understand and implement laboratory safety procedures.

ULO5: Interpret and draw sound conclusions from analytical chemical data.

ULO6: Communicate effectively within the conventions of the molecular sciences discipline.

General Assessment Information

Late Assessment Submission Penalty

From 1 July 2022, Students enrolled in Session based units with written assessments will have the following university standard late penalty applied. Please see <https://students.mq.edu.au/study/assessment-exams/assessments> for more information.

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. Submission time for all written assessments is set at 11:55 pm. A 1-hour grace period is provided to students who experience a technical concern.

For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, students need to submit an application for [Special Consideration](#). You should also immediately contact the Unit Convenor, Dr. Su Su Thae Hnit (susuthae.hnit@mq.edu.au).

Assessments where Late Submissions will be accepted

In this unit, late submissions will be accepted as follows:

- Laboratory reports and Workshops – YES, Standard Late Penalty applies
- Mid-semester test and Final 3 hours exam - NO, unless Special Consideration is

Granted

Please refer to the Macquarie University Assessment policy regarding submission of assignments, plagiarism, extensions, late submission etc.

Assessment Tasks

Name	Weighting	Hurdle	Due
Laboratory Work	25%	Yes	Two weeks after each lab session
Workshops	20%	No	One week after each workshop session
Mid-semester Test	10%	No	Week 7
Final 3 hour examination	45%	No	University Examination Period

Laboratory Work

Assessment Type ¹: Lab report

Indicative Time on Task ²: 15 hours

Due: **Two weeks after each lab session**

Weighting: **25%**

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

There will be 5 lab practicals with each lab assessment contributing 5%.

On successful completion you will be able to:

- Demonstrate an understanding of the concepts of molecular analysis and measurement in the molecular sciences.
- Explain the principles of a range of techniques used for the analysis and measurement employed in the molecular sciences.
- Apply quantitative analysis methods and statistical techniques for the collection and analysis of data relevant to the molecular sciences.
- Develop intermediary chemistry laboratory skills and understand and implement laboratory safety procedures.
- Interpret and draw sound conclusions from analytical chemical data.
- Communicate effectively within the conventions of the molecular sciences discipline.

Workshops

Assessment Type ¹: Problem set

Indicative Time on Task ²: 12 hours

Due: **One week after each workshop session**

Weighting: **20%**

There will be 6 workshops but only 4 workshops will be assessed. The assessment will be based on in class tasks and problem sets, with bonus marks available for optional take home exercises submitted after the classes.

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Mid-semester Test

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 5 hours

Due: **Week 7**

Weighting: **10%**

Mid Semester Test will be run in the Workshop and the topics within this test cover the lecture content from Week 1-Week 6.

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- Apply quantitative analysis methods and statistical techniques for the collection and analysis of data relevant to the molecular sciences.
- Interpret and draw sound conclusions from analytical chemical data.

Final 3 hour examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 30 hours

Due: **University Examination Period**

Weighting: **45%**

The final examination will be 3 hours in length with 10 minutes reading time, consisting of multiple choice and short answer questions. The final examination will cover all sections of the unit (lectures, lab practicals, workshops and assignments) and is designed to address specific understanding of all the concepts presented within the course.

On successful completion you will be able to:

- Demonstrate an understanding of the concepts of molecular analysis and measurement in the molecular sciences.
- Explain the principles of a range of techniques used for the analysis and measurement employed in the molecular sciences.
- Apply quantitative analysis methods and statistical techniques for the collection and analysis of data relevant to the molecular sciences.
- Develop intermediary chemistry laboratory skills and understand and implement laboratory safety procedures.
- Interpret and draw sound conclusions from analytical chemical data.
- Communicate effectively within the conventions of the molecular sciences discipline.

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

Lectures: Lectures will be presented formally. Some lecture material will be available on the unit website beforehand (in iLearn: <http://ilearn.mq.edu.au>), while other material will be provided in the lecture class. You are strongly encouraged to review the lecture material beforehand, so you can spend most of your time engaging with the lecture and ask questions in the class if you have them. There are two one-hour lectures per week for 13 weeks. Two Revision lectures will be provided in the last week of the semester.

Laboratory Classes: Practical classes are designed for you to develop basic laboratory, safety, and critical and analytical analysis skills. There will be 5 three-hour lab practicals on-campus. Laboratory notes will be available on iLearn for download and you are expected to have a read through all the planned activities. You must bring a hard copy of laboratory notes, a laboratory note book and lab coat to your laboratory class.

Workshop Classes: Workshop classes are designed to introduce students to a range of problem-solving skills and mainly consist of material related to lab practical, lecture topics, using a series of activities, problems, or questions during the workshop. There will be 6 two-hour workshops run fortnightly. Workshop notes will be available on iLearn for download. You are expected to have read through all of the planned activities.

Optional Weekly Online Questions: There are no formal tutorial classes in this unit, but optional weekly online questions with answer sheets will be provided on iLearn site of this unit.

Required and Recommended Texts and/or Materials:

Prescribed text:

- D.C.Harris and C.A.Lucy, Quantitative Chemical Analysis, 10th Edition, Macmillan Publishing. (2020)

Recommended Textbook and/or Materials:

- D. A.Skoog, D.M.West, F.J.Holler, S.R.Crouch, Fundamentals of Analytical Chemistry, 10th Edition, Brooks/Cole, Thomson Learning, Inc (2021).
- D.S. Hage, J.D. Carr, Analytical Chemistry and Quantitative Analysis, 1st Edition, Pearson (2011). (Chapter 23).

Technology Used and Required iLearn: You are expected to access the unit website on a frequent basis and download PDF files provided. You are strongly encouraged to make use of the discussion forum available on the unit website for general discussion of the materials presented in this unit. General use computers are provided by the University, but it would be

advantageous to have your own computer and internet access. Microsoft Office is available free of charge to Macquarie University students. See <https://students.mq.edu.au/support/technology/software/microsoft>. It is important that you have a scientific calculator as hand-held calculators will be used in practicals, workshops, for assignments, tests, and in the final examination. Note that text retrieval calculators are not allowed in the final examination. The use will be made of Excel and other data processing and display software. Computers carrying this software are available in the teaching laboratories. Items of interest and links to other online material will be placed on the unit iLearn website.

Unit Schedule

Lectures begin on 25th July 2022 and will be held on:

Day	Time	Location
Monday	1-2 pm	23 Wallys Walk - T2 Theatre
Tuesday	1-2 pm	23 Wallys Walk - T1 Theatre

Laboratory practicals start the second week of the semester and will be held on:

Classes	Weeks	Day	Time	Location
1	2, 4, 6, 8, 10	Friday	9-12 pm	14SCO-308, 347-349-350 Teaching Lab
2	2, 4, 6, 8, 10	Friday	2-5 pm	14SCO-308, 347-349-350 Teaching Lab

Students will need to register for **one** class only.

Workshop classes start the third week of the semester and will be held on:

Classes	Weeks	Day	Time	Location
1	3, 5, 7, 9, 11, 13	Thursday	9-11 am	14SCO-100 Theatrette
2	3, 5, 7, 9, 11, 13	Thursday	12-2 pm	14SCO-100 Theatrette
3	3, 5, 7, 9, 11, 13	Thursday	3-5 pm	14SCO-100 Theatrette

Students will need to register for **one** class only.

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 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.