



CHEM6201

Analysis and Measurement

Session 2, In person-scheduled-weekday, North Ryde 2024

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

Anastasiia Tukova

anastasiia.tukova@mq.edu.au

Contact via Email

4WW-221

Monday to Friday by appointment

Credit points

10

Prerequisites

Admission to GradDipBiotech or GradCertLabAQMgt or GradDipLabAQMgt or MBiotech or MBioBus or MLabAQMgt or MRadiopharmSc or MSc or MScInnovChemBioSc

Corequisites

Co-badged status

CHEM2201

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, 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

Requirements to Pass this Unit

To pass this unit you must:

- Achieve a total mark equal to or greater than 50%, and
- Participate in and undertake all hurdle activities for a minimum of 50%.

Hurdle Assessment

Laboratory Work (25%):

Development of knowledge and skills in a range of techniques used for the analysis and measurement employed in the molecular sciences requires continual practice at authentic problems in a laboratory-based setting.

There will be 5 lab practicals with each lab assessment contributing 5%. Each lab practical composed of prelab exercises (10%), in class lab book (10%) and the “lab report” (80%). The prelabs will be done online and will be due before your lab class. The in-class lab book will be completed during the lab class and hand submitted to your demonstrator before you leave that class. The lab report will be due after two weeks of completing each lab practical.

- You must attend and participate in the lab practical classes to pass CHEM6201. This is a

hurdle requirement meaning that failure to meet this requirement may result in a failed grade for the unit.

- You must obtain an average mark of 50% for your practicals (prelab, lab book, prac report). Resubmission of the practical report will be allowed for practicals that are assessed at between 40% and 50%. The maximum mark upon resubmission is 50%.
- Students are permitted to one absence from lab practicals and that absence will require the approval of Special Consideration Request. If the special consideration is approved, a catch-up lab practical need to be completed at a time organised by unit convenor.

Note: If you miss a lab practical class, you are NOT automatically entitled to a make-up class. Such an opportunity may be offered, if possible, if sufficient warning and special consideration approval is provided. You must also contact the Unit Convenor, Dr. Su Su Thae Hnit (susuthae.hnit@mq.edu.au).

Other assessments

Workshops (20%):

- There will be 6 workshops but only 4 workshops will be assessed, each worth 5%.
- The assessment will be based on in class tasks, quizzes and problem sets, with bonus marks available for optional take home exercises submitted after the classes.
- You must submit workshop exercises online after one week of completing each workshop.
- If you miss the workshop, please contact the Unit Convenor immediately.

Mid Semester Test (10%):

- The Mid Semester Test will be run in the Week 7 during workshop and the topics within this test cover the lecture content from Week 1-Week 6. It is one hour quiz type test.
- You will need to achieve a minimum of 50% to pass the Mid Semester Test.
- If you miss the Mid Semester Test, you will not be granted a supplementary test unless provided with special consideration approval.

Final 3 hour examination (45%):

- The final examination will be 3 hours, consisting of multiple choice and short answer questions.
- The final examination will cover all sections of the unit (lectures, lab practicals, workshops, and weekly questions) and is designed to address specific understanding of all the concepts presented within the course.

- If you receive a special consideration for the final exam, a supplementary exam will be scheduled in the interval between the regular exam period and the start of the next session. Please ensure that you are familiar with the policy prior to submitting an application.

Grade Book:

The assessments marks will be displayed on iLearn through Gradebook. It is your responsibility to regularly verify that the records displayed in Gradebook are correct. If you have any difficulties in completing the hurdle and other assessment tasks, please contact to Unit Convenor immediately.

Late Assessment Submission Penalty

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark of the task) will be applied for each day a written report or presentation 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. The submission time for all uploaded assessments is 11:55 pm. A 1-hour grace period will be provided to students who experience a technical concern.

For any late submission of time-sensitive tasks, such as scheduled tests/exams, and/or scheduled workshops or lab practical assessment, please apply for [Special Consideration](#). You should also immediately contact the Unit Convenor. Please see <https://students.mq.edu.au/study/assessment-exams/assessments> for more information.

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 - NO, unless Special Consideration is Granted.

Please refer to the [Macquarie University Assessment policy](#) regarding submission.

Special Consideration

[The Special Consideration Policy](#) aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable, and significantly disruptive, and which may affect their performance in assessment. If you experience circumstances or events that affect your ability to complete the assessments in this unit on time, please inform the Unit Convenor, Dr. Su Su Thae Hnit (susuthae.hnit@mq.edu.au) and submit a Special Consideration request through ask.mq.edu.au.

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.

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.
- Interpret and draw sound conclusions from analytical chemical data.
- Communicate effectively within the conventions of the molecular sciences discipline.

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.

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.
- 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

Week 1 activities: Students are expected to review the Week 1 lecture materials and undertake the week 1 weekly online questions provided in [iLearn](#).

Lectures: Lectures will commence in Week 1. Lectures will be presented formally. Some lecture material will be available on the unit website beforehand, 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: Laboratory classes will begin in Week 2. 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 complete the prelab exercises/quizzes online before attending laboratory classes.
- You must bring a hard copy of laboratory notes, a laboratory note book which will be assessed by demonstrators before leaving the class and a lab coat to your laboratory class.

Workshop Classes: Workshop classes will start in Week 3. 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 the planned activities.
- You must bring your own laptop for the workshop activities.

Optional Weekly Online Questions: 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. You will use 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.

Methods of Communication

During the semester, the CHEM6201 iLearn site will be used to communicate important information to you. Emails will also be sent to your student account. Please check the announcement on iLearn page and your student's email frequently. Students are encouraged to use discussion board for queries. Please feel free to communicate directly with your unit convenor using the contact details provided on the iLearn.

Dr. Su Su Thae Hnit: Appointment by email susuthe.hnit@mq.edu.au

Anastasiia Tukova: Appointment by email anastasiia.tukova@mq.edu.au

COVID Information

For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie website: <https://www.mq.edu.au/about/coronavirus-faqs>. Remember to check this page regularly in case the information and requirements change during semester. If there are any changes to this unit in relation to COVID, these will be communicated via iLearn.

Unit Schedule

Lectures begin on 24th July 2024 and will be held on:

Day	Time	Location
Wednesday	2-3 pm	23 Wallys Walk - T1 Theatre
Friday	12-1 pm	23 Wallys Walk - Price Lecture Theatre

Laboratory practicals start on 2nd August 2024 and will be held on:

Classes	Weeks	Day	Time	Location
1	2, 4, 6, 8, 10	Friday	9-12 pm	14SCO-308, 320, 349-350, 12ER 150 Teaching Lab

2	2, 4, 6, 8, 10	Friday	2-5 pm	14SCO-308, 320, 349-350, 12ER 150 Teaching Lab
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Students will need to register for **one** class only.

Workshop classes start on 9th August 2024 and will be held on:

Classes	Weeks	Day	Time	Location
1	3, 5, 7, 9, 11, 13	Thursday	9-11 am	01CC 216 Groupwork Learning Space
2	3, 5, 7, 9, 11, 13	Thursday	12-2 pm	01CC 215 Groupwork Learning Space
3	3, 5, 7, 9, 11, 13	Thursday	3-5 pm	01CC 215 Groupwork Learning Space

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 connect.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 Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via the [Service Connect Portal](#), 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.

Changes from Previous Offering

We value student feedback to be able to continually improve the way we offer our units. As such we encourage students to provide constructive feedback via student surveys, to the teaching staff directly, or via the FSE Student Experience & Feedback link in the iLearn page.

Student feedback from the previous offering of this unit was very positive overall, with students pleased with the clarity around assessment requirements and the level of support from teaching staff. As such, no change to the delivery of the unit is planned, however we will continue to strive to improve the level of support and the level of student engagement.

Unit information based on version 2024.02 of the [Handbook](#)