



MOLS7911

Laboratory Skills for Molecular Science Research

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

School of Natural Sciences

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Disclaimer

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General Information

Unit convenor and teaching staff

Unit Convener

Sasha Tetu

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14ER room 201

Mon-Thur

Credit points

10

Prerequisites

Admission to MRes

Corequisites

Co-badged status

Unit description

This unit will provide hands-on experience of several of the sophisticated technologies currently utilised in molecular science. Students will select a portfolio of techniques across chemistry, biochemistry, biophysics, genomics or microbiology, according to their discipline background and interest. Independent skills and technical competency in a minimum of three contemporary methodologies or instrumentation types will be developed through intensive practical sessions with Macquarie researchers. This is a skills-focused unit designed to practically enrich methods encountered from a more theoretical standpoint in other units.

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: Utilise appropriate practical and procedural knowledge to perform advanced methods in contemporary molecular research and describe how these methods are used to solve contemporary problems

ULO2: Demonstrate individual technical skills in sample handling and instrumentation relevant to the research (as distinct from classroom) setting for their chosen methods

ULO3: Execute independent analytical and critical skills required for scientific

experimentation and research design allowing to implement the correct methodology to characterise a specific type of sample

ULO4: Analyse experimental data gathered from a range of research technologies and communicate the outcomes of this analysis in written and oral form

General Assessment Information

Requirements to Pass this Unit

To pass this unit you must:

- Attempt all assessments, and
- Achieve a total mark equal to or greater than 50%

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, performance assessments/presentations, and/or scheduled practical assessments/labs, please apply for [Special Consideration](#).

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 convenor and submit a Special Consideration request through ask.mq.edu.au.

Assessment Tasks

Name	Weighting	Hurdle	Due
Module 1: Report	33%	No	Week 5
Module 2: Report	33%	No	Week 9

Name	Weighting	Hurdle	Due
Module 3: Report	34%	No	Week 13

Module 1: Report

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 38 hours

Due: **Week 5**

Weighting: **33%**

Report, Standard Operating Procedure (SOP) or skills evaluation; as appropriate

On successful completion you will be able to:

- Utilise appropriate practical and procedural knowledge to perform advanced methods in contemporary molecular research and describe how these methods are used to solve contemporary problems
- Demonstrate individual technical skills in sample handling and instrumentation relevant to the research (as distinct from classroom) setting for their chosen methods
- Execute independent analytical and critical skills required for scientific experimentation and research design allowing to implement the correct methodology to characterise a specific type of sample
- Analyse experimental data gathered from a range of research technologies and communicate the outcomes of this analysis in written and oral form

Module 2: Report

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 38 hours

Due: **Week 9**

Weighting: **33%**

Report, Standard Operating Procedure (SOP) or skills evaluation; as appropriate

On successful completion you will be able to:

- Utilise appropriate practical and procedural knowledge to perform advanced methods in contemporary molecular research and describe how these methods are used to solve

contemporary problems

- Demonstrate individual technical skills in sample handling and instrumentation relevant to the research (as distinct from classroom) setting for their chosen methods
- Execute independent analytical and critical skills required for scientific experimentation and research design allowing to implement the correct methodology to characterise a specific type of sample
- Analyse experimental data gathered from a range of research technologies and communicate the outcomes of this analysis in written and oral form

Module 3: Report

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 38 hours

Due: **Week 13**

Weighting: **34%**

Report, Standard Operating Procedure (SOP) or skills evaluation; as appropriate

On successful completion you will be able to:

- Utilise appropriate practical and procedural knowledge to perform advanced methods in contemporary molecular research and describe how these methods are used to solve contemporary problems
- Demonstrate individual technical skills in sample handling and instrumentation relevant to the research (as distinct from classroom) setting for their chosen methods
- Execute independent analytical and critical skills required for scientific experimentation and research design allowing to implement the correct methodology to characterise a specific type of sample
- Analyse experimental data gathered from a range of research technologies and communicate the outcomes of this analysis in written and oral form

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

This unit is designed to provide you with the opportunity to gain lab-based skills applicable to modern molecular science research.

In week 1 please attend the on campus introductory session (time and location details to be provided on iLearn) which will assist you with your choice of module topic.

Skills modules will run from week 2 onwards and will take place on campus, with locations specific to each technique (further information will be provided on iLearn).

Methods of Communication

We will communicate with you via your university email or through announcements on iLearn. Queries to convenors can either be placed on the iLearn discussion board or sent to MOLS7911@mq.edu.au from your **university email** address.

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

Students will complete three separate lab skills modules throughout the semester. For each module students can select between two different techniques and will then gain hands on experience in how to apply their chosen technique in a research setting.

Module 1 (weeks 2-5): Synthetic Biology OR NMR Spectroscopy for Synthetic Chemistry

Module 2 (weeks 6-9): Microscopy OR Flow Cytometry

Module 3 (weeks 10-13): Antimicrobial discovery using Galleria OR Spectroscopy (CD/IR)

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 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.