MOLS7911

Laboratory Skills for Molecular Science Research

Session 1, In person-scheduled-weekday, North Ryde 2022

School of Natural Sciences

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General Information

Unit convenor and teaching staff
Sasha Tetu
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Contact via contact via email
room 201 14ER (E8A201)
Monday_Thursday

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: Utlise 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

General Faculty Policy on assessment submission deadlines and late submissions:

Online quizzes, in-class activities, or scheduled tests and exam must be undertaken at the time indicated in the unit guide. Should these activities be missed due to illness or misadventure, students may apply for Special Consideration.

All other assessments must be submitted by 5:00 pm on their due date. Should these assessments be missed due to illness or misadventure, students should apply for Special Consideration.

Assessments not submitted by the due date will receive a mark of zero **unless** late submissions are specifically allowed as indicated in the unit guide or on iLearn.

If late submissions are permitted as indicated in the unit guide or on iLearn a consistent penalty will be applied for late submissions as follows:

A 12-hour grace period will be given after which the following deductions will be applied to the awarded assessment mark: 12 to 24 hours late = 10% deduction; for each day thereafter, an additional 10% per day or part thereof will be applied until five days beyond the due date. After this time, a mark of zero (0) will be given. For example, an assessment worth 20% is due 5 pm on 1 January. Student A submits the assessment at 1 pm, 3 January. The assessment received a mark of 15/20. A 20% deduction is then applied to the mark of 15, resulting in the loss of three (3) marks. Student A is then awarded a final mark of 12/20.

Note, Late submissions will be accepted for all assessments in this unit with penalties, as described above

Assessment Tasks

Name	Weighting	Hurdle	Due
Module 1: Report	33%	No	
Module 2: Report	33%	No	
Module 3: Report	34%	No	

Module 1: Report

Assessment Type [1]: Practice-based task

Indicative Time on Task [2]: 45 hours
Due:
Weighting: **33%**

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

On successful completion you will be able to:

- Utlise 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]: 45 hours
Due:
Weighting: **33%**

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

On successful completion you will be able to:

- Utlise 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]: 47 hours
Due:
Weighting: **34%**

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

On successful completion you will be able to:

- Utlise 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

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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

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

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 Physical Adsorption

Module 2 (weeks 7-10): Microscopy OR NMR Spectroscopy for Synthetic Chemistry

Module 3 (weeks 10-13): Flow Cytometry OR Spectroscopy (CD/IR)

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (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). 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) 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.

Changes from Previous Offering

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.

Any further requirements or changes to units in relation to COVID will be communicated to students via iLearn.

Off-shore students

Off-shore students **must** email the convenor as soon as possible to discuss study options.