



CBMS780

The Research Experience

S2 Day 2017

Dept of Chemistry & Biomolecular Sciences

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General Information

Unit convenor and teaching staff

Unit Convenor

Bridget Mabbutt

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Louise Brown

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Credit points

4

Prerequisites

Admission to MRes and 16cp at 700 level

Corequisites

Co-badged status

Unit description

This unit is designed to provide hands-on experience by direct interface with molecular science underway in the Department of Chemistry and Biomolecular Sciences. Students will participate in the programs of two distinct research groups over the semester and navigate typical situations encountered as members of a scientific research team. They will engage in a range of pertinent laboratory activities, receive preparative training in advanced molecular techniques from research scientists, and attend team meetings at which experimental data are reviewed and research planning is encountered.

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:

Have an increased awareness of contemporary research practice through participation across a range of molecular science research teams

Have begun to acquire practical knowledge of advanced laboratory methods, incorporating appropriate safe handling of materials (chemical, biological or radioactive)

Have actively participated in data collection and reported/reflected on experimental

findings to the research team

Have maintained a daily record, to research-level standards, of laboratory work undertaken, results and their interpretation

Have contributed to the experimental planning/review cycle in a laboratory-based research setting

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Laboratory notebook A</u>	15%	No	20th September
<u>Research presentation A</u>	15%	No	15th September
<u>Supervisor A report</u>	20%	No	20th September
<u>Laboratory notebook B</u>	15%	No	9th November
<u>Research presentation B</u>	15%	No	6th November
<u>Supervisor B report</u>	20%	No	9th November

Laboratory notebook A

Due: **20th September**

Weighting: **15%**

A notebook will be provided for the recording of your daily laboratory activities in a style appropriate to the relevant research discipline. A laboratory notebook is generally regarded as the primary source of new experimental information; granting authorities require notebooks to be retained within funded laboratories (i.e. they are not the property of any individual researcher).

Your research team will be able to provide you with lab books from other postgraduate students as appropriate examples of experimental record-keeping.

Your lab notebook must be written up as experiments are set-up and progress, alongside your observations or insights. Each task and observation must be clearly dated, and reflection noted on the experimental result. The level of description should be sufficient to allow experiments to be replicated by another worker. The names and storage location of all data files and samples related to each experiment must be identified clearly.

Your notebook must be certified on a weekly basis by your supervisor or a senior researcher in your team. Marks will be deducted if this is not done.

At the end of your rotation, you must submit your completed lab book to the Unit convenor for marking. Marking will incorporate assessment of (i) clarity of recording of experiments conducted, (ii) organisation of data or observations, and (iii) degree of personal interpretation and reflection.

You will be informed of your awarded mark for this task, together with general feedback, within 2 weeks of submission. This lab book will be returned to the hosting lab for its record keeping.

On successful completion you will be able to:

- Have an increased awareness of contemporary research practice through participation across a range of molecular science research teams
- Have begun to acquire practical knowledge of advanced laboratory methods, incorporating appropriate safe handling of materials (chemical, biological or radioactive)
- Have actively participated in data collection and reported/reflected on experimental findings to the research team
- Have maintained a daily record, to research-level standards, of laboratory work undertaken, results and their interpretation

Research presentation A

Due: **15th September**

Weighting: **15%**

During the last week of your research visit (i.e. Week 7), you will give a 15 - 20 min Powerpoint presentation to your hosting research group outlining:

- (i) the work in which you participated,
- (ii) background literature to the overall project,
- (iii) a critique of experiments in which you were involved, and
- (iv) an outline of any results obtained.

It is expected that your presentation will be scheduled within a regular research meeting of your hosting laboratory. You will be questioned by research team members and receive constructive feedback on your results or understanding. By attending group meetings throughout your research team visit, you will be exposed to examples of short presentations by other student researchers.

Your presentation and responses to feedback will be marked by your research supervisor, according to the University's standard grade descriptors (HD, D, Cr, P). You will be informed of the mark you have achieved before commencement of your Lab B placement.

On successful completion you will be able to:

- Have actively participated in data collection and reported/reflected on experimental findings to the research team
- Have contributed to the experimental planning/review cycle in a laboratory-based research setting

Supervisor A report

Due: **20th September**

Weighting: **20%**

Your supervisor will provide a report to the Unit convenor evaluating your laboratory performance (worth 10%), technical competencies gained (5%) and degree of engagement with the project work (5%).

Factors such as attention to detail, ability to learn new methods, your contribution to experimental interpretation, and interactions with the research team will contribute to this assessment. A copy of the marking rubric used by supervisors for this evaluation is provided on the iLearn site.

You will be informed of your overall grade for this Assessment task prior to commencement of your Lab B placement.

On successful completion you will be able to:

- Have begun to acquire practical knowledge of advanced laboratory methods, incorporating appropriate safe handling of materials (chemical, biological or radioactive)
- Have actively participated in data collection and reported/reflected on experimental findings to the research team

Laboratory notebook B

Due: **9th November**

Weighting: **15%**

As for laboratory notebook A.

At the end of your second rotation, the Unit convenor will review and assess your laboratory notebook.

You will be informed of your awarded mark for this task, together with general feedback, within 2 weeks of submission. This lab book will be returned to the hosting lab for its record keeping.

On successful completion you will be able to:

- Have an increased awareness of contemporary research practice through participation across a range of molecular science research teams
- Have begun to acquire practical knowledge of advanced laboratory methods, incorporating appropriate safe handling of materials (chemical, biological or radioactive)
- Have actively participated in data collection and reported/reflected on experimental findings to the research team
- Have maintained a daily record, to research-level standards, of laboratory work

undertaken, results and their interpretation

Research presentation B

Due: **6th November**

Weighting: **15%**

As for Research presentation A, to be scheduled within a team meeting during Week 12/13.

Your presentation and responses to feedback will be marked by your second research supervisor, according to the University's standard grade descriptors (HD, D, Cr, P). You will be informed of the mark you have achieved within 2 weeks of completion.

On successful completion you will be able to:

- Have actively participated in data collection and reported/reflected on experimental findings to the research team
- Have contributed to the experimental planning/review cycle in a laboratory-based research setting

Supervisor B report

Due: **9th November**

Weighting: **20%**

This assessment will be conducted as for Supervisor Report A.

You will be informed of your overall grade for this Assessment task within 2 weeks of completion.

On successful completion you will be able to:

- Have begun to acquire practical knowledge of advanced laboratory methods, incorporating appropriate safe handling of materials (chemical, biological or radioactive)
- Have actively participated in data collection and reported/reflected on experimental findings to the research team

Delivery and Resources

As well as attending compulsory induction sessions in Weeks 1 and 2, you will need to arrange to meet with four Project leaders to discuss projects underway in their teams.

Following this introduction to researchers in CBMS, you will be asked to nominate up to 3 whose work interests you for future work. Two of these will be assigned to you as your Lab A and Lab B experiences (as best accommodated by all student preferences).

During the two 5 week-sessions of laboratory work, you are expected to be present in the participating laboratory for ~14 hours per week. During this time, as well as participating in experiments under close supervision, you will write up a laboratory notebook, conduct background literature surveys and attend group meetings and seminars.

Technologies Used and Required

Consumable costs have been provided to each hosting laboratory towards your laboratory costs, and you will be provided with basic laboratory needs, including lab notebook. Specialist scientific equipment, computers and software will be made available to you under supervision, but you will require your own laptop with basic software installed to prepare your reports and presentation.

Unit Schedule

Following relevant introduction session in Weeks 1 and 2, the class will not use the scheduled "lecture" slot: instead you will arrange suitable weekday working times with your laboratory head, according to mutual timetables.

The Unit will be generally structured as follows:

Weeks 1&2: Unit introduction; Meet with CBMS Laboratory Heads, chemical and biosafety induction; notification of lab placements

Weeks 3-7: Placement, Lab A

Weeks 8-12: Placement, Lab B

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy_2016.html

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy (in effect until Dec 4th, 2017): http://www.mq.edu.au/policy/docs/disruption_studies/policy.html

Special Consideration Policy (in effect from Dec 4th, 2017): <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration>

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, 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.m](#)

mq.edu.au.

Please note due dates for all tasks. No extensions will be granted, unless a case for Special Consideration has been made through the Faculty site and approved by the Unit convenor.

Your laboratory notebooks must be handed in person to the Unit convenor by the due date. Late work will be penalised.

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 improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and 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.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

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.

Graduate Capabilities

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcomes

- Have an increased awareness of contemporary research practice through participation across a range of molecular science research teams
- Have contributed to the experimental planning/review cycle in a laboratory-based research setting

Assessment tasks

- Laboratory notebook A
- Research presentation A
- Supervisor A report
- Laboratory notebook B
- Research presentation B
- Supervisor B report

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcomes

- Have an increased awareness of contemporary research practice through participation across a range of molecular science research teams
- Have begun to acquire practical knowledge of advanced laboratory methods, incorporating appropriate safe handling of materials (chemical, biological or radioactive)
- Have actively participated in data collection and reported/reflected on experimental findings to the research team
- Have maintained a daily record, to research-level standards, of laboratory work undertaken, results and their interpretation

Assessment tasks

- Laboratory notebook A
- Research presentation A
- Supervisor A report
- Laboratory notebook B
- Research presentation B
- Supervisor B report

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- Have an increased awareness of contemporary research practice through participation across a range of molecular science research teams
- Have actively participated in data collection and reported/reflected on experimental findings to the research team
- Have maintained a daily record, to research-level standards, of laboratory work undertaken, results and their interpretation
- Have contributed to the experimental planning/review cycle in a laboratory-based research setting

Assessment tasks

- Laboratory notebook A
- Research presentation A
- Supervisor A report
- Laboratory notebook B
- Research presentation B
- Supervisor B report

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- Have an increased awareness of contemporary research practice through participation across a range of molecular science research teams
- Have begun to acquire practical knowledge of advanced laboratory methods, incorporating appropriate safe handling of materials (chemical, biological or radioactive)

- Have actively participated in data collection and reported/reflected on experimental findings to the research team
- Have contributed to the experimental planning/review cycle in a laboratory-based research setting

Assessment tasks

- Laboratory notebook A
- Research presentation A
- Supervisor A report
- Laboratory notebook B
- Research presentation B
- Supervisor B report

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcomes

- Have actively participated in data collection and reported/reflected on experimental findings to the research team
- Have maintained a daily record, to research-level standards, of laboratory work undertaken, results and their interpretation
- Have contributed to the experimental planning/review cycle in a laboratory-based research setting

Assessment tasks

- Laboratory notebook A
- Research presentation A
- Supervisor A report
- Laboratory notebook B
- Research presentation B
- Supervisor B report

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in

relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

Learning outcomes

- Have begun to acquire practical knowledge of advanced laboratory methods, incorporating appropriate safe handling of materials (chemical, biological or radioactive)
- Have contributed to the experimental planning/review cycle in a laboratory-based research setting

Assessment tasks

- Laboratory notebook A
- Research presentation A
- Supervisor A report
- Laboratory notebook B
- Research presentation B
- Supervisor B report

Changes from Previous Offering

In 2017, your two Lab research presentations are now each weighted 15% (reduced from 25%), and your Supervisor evaluations are weighted 20% (an increase from 10%).