



CBMS780

The Research Experience

S2 Day 2014

Chemistry and Biomolecular Sciences

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General Information

Unit convenor and teaching staff

Unit Convenor

Bridget Mabbutt

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Tutor

Bhumika Shah

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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 three 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:

To experience contemporary research practice in molecular science across a range of laboratory groups

To develop practical skills with advanced laboratory methods, including the safe handling of chemical, biological or radioactive materials, as appropriate

To participate in data collection and report/reflect on experimental findings to the research team

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

To participate in the planning/review cycle of an experimentally-based research team

Assessment Tasks

Name	Weighting	Due
<u>Laboratory notebook A</u>	15%	22nd September
<u>Research presentation A</u>	25%	19th September
<u>Supervisor A report</u>	10%	26th September
<u>Laboratory notebook B</u>	15%	10th November
<u>Research presentation B</u>	25%	7th November
<u>Supervisor B report</u>	10%	14th November

Laboratory notebook A

Due: **22nd September**

Weighting: **15%**

You will be provided with a notebook in which you will record your daily laboratory activities in a manner appropriate to the research discipline in which you are working. The laboratory notebook is generally regarded as the primary source of new experimental information, and many granting authorities require notebooks to be retained by funded laboratories (i.e. they are not the property of the researcher).

Your lab notebook must be written up as experiments are set up and progress, alongside relevant observations or insights. Each task and observation must be clearly dated. The level of description should be sufficient to allow experiments to be replicated by another worker. The names and location of all data files 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. At the end of your rotation, the quality of reporting within your laboratory notebook will be assessed by the Unit convenor.

On successful completion you will be able to:

- To experience contemporary research practice in molecular science across a range of

laboratory groups

- To develop practical skills with advanced laboratory methods, including the safe handling of chemical, biological or radioactive materials, as appropriate
- To participate in data collection and report/reflect on experimental findings to the research team
- To maintain a daily laboratory record of work undertaken, results and their interpretation, to research-level standards

Research presentation A

Due: **19th September**

Weighting: **25%**

You will give a 30 min Powerpoint presentation to your research group outlining the work in which you participated, background literature, a critique of experiments in which you were involved and an outline of your results. You will be questioned by your research team members and receive constructive feedback on your presentation.

Your presentation will be marked by your research supervisor.

On successful completion you will be able to:

- To experience contemporary research practice in molecular science across a range of laboratory groups
- To develop practical skills with advanced laboratory methods, including the safe handling of chemical, biological or radioactive materials, as appropriate
- To participate in data collection and report/reflect on experimental findings to the research team
- To participate in the planning/review cycle of an experimentally-based research team

Supervisor A report

Due: **26th September**

Weighting: **10%**

Your supervisor will provide a report to the Unit convenor evaluating your laboratory performance, technical competencies gained and degree of engagement. 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.

On successful completion you will be able to:

- To develop practical skills with advanced laboratory methods, including the safe handling of chemical, biological or radioactive materials, as appropriate
- To participate in data collection and report/reflect on experimental findings to the

research team

- To participate in the planning/review cycle of an experimentally-based research team

Laboratory notebook B

Due: **10th November**

Weighting: **15%**

As for laboratory notebook A.

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

On successful completion you will be able to:

- To experience contemporary research practice in molecular science across a range of laboratory groups
- To develop practical skills with advanced laboratory methods, including the safe handling of chemical, biological or radioactive materials, as appropriate
- To participate in data collection and report/reflect on experimental findings to the research team
- To maintain a daily laboratory record of work undertaken, results and their interpretation, to research-level standards

Research presentation B

Due: **7th November**

Weighting: **25%**

As for Research presentation A.

On successful completion you will be able to:

- To experience contemporary research practice in molecular science across a range of laboratory groups
- To develop practical skills with advanced laboratory methods, including the safe handling of chemical, biological or radioactive materials, as appropriate
- To participate in data collection and report/reflect on experimental findings to the research team
- To participate in the planning/review cycle of an experimentally-based research team

Supervisor B report

Due: **14th November**

Weighting: **10%**

As for Supervisor Report A.

On successful completion you will be able to:

- To develop practical skills with advanced laboratory methods, including the safe handling of chemical, biological or radioactive materials, as appropriate
- To participate in data collection and report/reflect on experimental findings to the research team
- To participate in the planning/review cycle of an experimentally-based research team

Delivery and Resources

Following the information about research projects available and induction sessions run in Weeks 1 and 2, you will be asked to nominate up to four projects that interest you. Two will be assigned to best accommodate your preferences, within the spaces made available by team leaders.

During the 10 weeks of laboratory work, you are expected to be present in each participating laboratory for ~15 hours per week. During this time, as well as participating in experiments, you will write up your laboratory notebook, conduct background literature surveys and attend group meetings and seminars.

Technologies Used and Required

Experimental consumable costs have been provided to each hosting laboratory, 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

For detailed schedules and locations, you must consult the CBMS780 iLearn site.

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: Lab placement A

Weeks 8-12: Lab placement 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.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

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

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

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/

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://informatics.mq.edu.au/hel>

p/.

When using the University's IT, you must adhere to the [Acceptable Use Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

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

- To experience contemporary research practice in molecular science across a range of laboratory groups
- To develop practical skills with advanced laboratory methods, including the safe handling of chemical, biological or radioactive materials, as appropriate
- To participate in data collection and report/reflect on experimental findings to the research team
- To maintain a daily laboratory record of work undertaken, results and their interpretation, to research-level standards

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

- To participate in data collection and report/reflect on experimental findings to the research team
- To participate in the planning/review cycle of an experimentally-based research team

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

- To experience contemporary research practice in molecular science across a range of laboratory groups
- To participate in data collection and report/reflect on experimental findings to the research team
- To maintain a daily laboratory record of work undertaken, results and their interpretation, to research-level standards
- To participate in the planning/review cycle of an experimentally-based research team

Assessment tasks

- Research presentation A
- Supervisor A report
- 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

- To participate in data collection and report/reflect on experimental findings to the research team
- To participate in the planning/review cycle of an experimentally-based research team

Assessment tasks

- Research presentation A
- Supervisor A report
- 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

- To experience contemporary research practice in molecular science across a range of laboratory groups
- To participate in the planning/review cycle of an experimentally-based research team

Assessment tasks

- Supervisor A report
- Supervisor B report

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

- To develop practical skills with advanced laboratory methods, including the safe handling of chemical, biological or radioactive materials, as appropriate
- To maintain a daily laboratory record of work undertaken, results and their interpretation, to research-level standards
- To participate in the planning/review cycle of an experimentally-based research team

Assessment tasks

- Supervisor A report
- Supervisor B report

Changes from Previous Offering

Literature review tasks have been amalgamated into Laboratory presentations. Assessment weightings have been modified accordingly.