



BIOL703

Research Skills for Biology

S1 Day 2019

Dept of Biological Sciences

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General Information

Unit convenor and teaching staff

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Credit points

4

Prerequisites

Admission to MRes

Corequisites

Co-badged status

Unit description

This unit has been developed specifically for new MRes students to provide them with a solid foundation in the philosophy and undertaking of scientific research. Through a series of workshops students will incrementally build their skills and knowledge of research in Biological Sciences. In parallel, students will undertake a small research project through which they apply the very skills they are discussing in workshops and tutorial classes. The unit will provide students with experience in formulating hypotheses, designing experiments, data collection, analyses, and communication of results. The unit provides a recap of statistical analysis and works specifically to refine the writing and communication skills of students through various formats.

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:

Be able to analyse data to answer experimental hypotheses

Identify and address the risks associated with research in biological and environmental sciences

Collect and store safely high quality research data and critically evaluate those data for completeness, adequacy and quality

Understand scientific method and the process of generating and testing hypotheses
Critically review, evaluate and summarise scientific data and information
Design and undertake small research projects in an aspect of biological and environmental sciences
Prepare and present scientific information to a professional standard to different audiences and in different ways

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Project pre-registration</u>	15%	No	week 5 & 13
<u>Diary for data carpentry</u>	24%	No	weekly
<u>Class presentation of project</u>	25%	No	7/6/19
<u>Data record and archive</u>	6%	No	31//5/19
<u>Written Project Fact sheet</u>	30%	No	14/6/19

Project pre-registration

Due: **week 5 & 13**

Weighting: **15%**

Students will complete a pre registration of their project and submit via iLearn. The pre registration will outline background, aims and methods of your research project. Students will consult with their mentors in the preparation of the proposal. After completing your project you should reflect on your preregistration and revise and resubmit

On successful completion you will be able to:

- Identify and address the risks associated with research in biological and environmental sciences
- Collect and store safely high quality research data and critically evaluate those data for completeness, adequacy and quality
- Understand scientific method and the process of generating and testing hypotheses
- Design and undertake small research projects in an aspect of biological and environmental sciences

Diary for data carpentry

Due: **weekly**

Weighting: **24%**

Students will record weekly their progress on the data carpentry activities, outlining the weekly plan (intentions), the actions undertaken to achieve the plan, and a record of outcomes or results. Records should provide sufficient detail to repeat the process and trouble shoot problems, and serve as a reference for future analyses. Diary entries will be submitted weekly.

On successful completion you will be able to:

- Be able to analyse data to answer experimental hypotheses
- Understand scientific method and the process of generating and testing hypotheses
- Critically review, evaluate and summarise scientific data and information
- Design and undertake small research projects in an aspect of biological and environmental sciences

Class presentation of project

Due: **7/6/19**

Weighting: **25%**

An oral presentation of your research projects using the EGU Conference [pico presentation template](#). This presentation will be assessed by presentation attendees using a rubric.

On successful completion you will be able to:

- Be able to analyse data to answer experimental hypotheses
- Understand scientific method and the process of generating and testing hypotheses
- Critically review, evaluate and summarise scientific data and information
- Design and undertake small research projects in an aspect of biological and environmental sciences
- Prepare and present scientific information to a professional standard to different audiences and in different ways

Data record and archive

Due: **31/5/19**

Weighting: **6%**

Submit copies of your raw data records (eg field data sheets), and electronic data in an appropriate archival format.

On successful completion you will be able to:

- Collect and store safely high quality research data and critically evaluate those data for completeness, adequacy and quality
- Critically review, evaluate and summarise scientific data and information

- Design and undertake small research projects in an aspect of biological and environmental sciences

Written Project Fact sheet

Due: **14/6/19**

Weighting: **30%**

A one-page fact sheet on your research project that is suitable for communicating the importance of your research project and the results/outcomes to the general community.

On successful completion you will be able to:

- Be able to analyse data to answer experimental hypotheses
- Design and undertake small research projects in an aspect of biological and environmental sciences
- Prepare and present scientific information to a professional standard to different audiences and in different ways

Delivery and Resources

Unit content will be delivered in lectures and via ilearn.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). 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](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Undergraduate students seeking more policy resources can visit the [Student Policy Gateway \(https://students.mq.edu.au/support/study/student-policy-gateway\)](https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central)

[s://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/study/getting-started/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

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

If you are a Global MBA student contact globalmba.support@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

- Identify and address the risks associated with research in biological and environmental sciences
- Collect and store safely high quality research data and critically evaluate those data for completeness, adequacy and quality

Assessment task

- Written Project Fact sheet

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

- Identify and address the risks associated with research in biological and environmental sciences
- Collect and store safely high quality research data and critically evaluate those data for completeness, adequacy and quality
- Understand scientific method and the process of generating and testing hypotheses
- Design and undertake small research projects in an aspect of biological and environmental sciences

Assessment tasks

- Project pre-registration
- Diary for data carpentry
- Written Project Fact sheet

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

- Be able to analyse data to answer experimental hypotheses
- Collect and store safely high quality research data and critically evaluate those data for completeness, adequacy and quality
- Understand scientific method and the process of generating and testing hypotheses
- Critically review, evaluate and summarise scientific data and information
- Design and undertake small research projects in an aspect of biological and environmental sciences

Assessment tasks

- Project pre-registration
- Diary for data carpentry
- Data record and archive
- Written Project Fact sheet

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

- Be able to analyse data to answer experimental hypotheses
- Collect and store safely high quality research data and critically evaluate those data for completeness, adequacy and quality
- Understand scientific method and the process of generating and testing hypotheses
- Critically review, evaluate and summarise scientific data and information
- Design and undertake small research projects in an aspect of biological and environmental sciences

Assessment tasks

- Project pre-registration
- Diary for data carpentry
- Written Project Fact sheet

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 outcome

- Prepare and present scientific information to a professional standard to different audiences and in different ways

Assessment tasks

- Class presentation of project
- Written Project Fact sheet

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

- Identify and address the risks associated with research in biological and environmental sciences
- Design and undertake small research projects in an aspect of biological and environmental sciences