



# BIOL116

## Biology in Practice

S1 Day 2016

*Dept of Biological Sciences*

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## General Information

Unit convenor and teaching staff

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Co-convenor

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Credit points

3

Prerequisites

Corequisites

Co-badged status

### Unit description

Biology in Practice is a skills based unit that aims to ensure you have the required laboratory, safety, field and practical skills essential to studying biology required as a basis for all units offered in the Dept of Biological Sciences. The unit will consist of a mixture of lectures, tutorials and practicals. You will acquire hands-on skills for working in the field and the laboratory, including the use of microscopes, data collection, analysis and graphing, aseptic techniques, skills for microbiological and molecular work as well as accessing and interpreting scientific literature. We will discuss broader topics about the scientific working environment, ethics and career pathways.

## 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:

Articulate and practice the importance of health and safety in biological sciences (lab and field).

Develop and demonstrate competencies in set up, operation and shutting down/clean-up of standard laboratory and field equipment.

Develop and demonstrate competencies in standard laboratory techniques (e.g. dilutions, aseptic plating, imagery and measurement, labelling).

Maintain an experimental notebook (field and lab); includes field observations with information related to environmental parameters and conditions.

Demonstrate competency in data collation, basic statistical analyses and representation by appropriate graphs in reports.

Describe and practice scientific methods from generating hypotheses and predictions through to following experimental procedures, and undertaking data collection.

Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).

Develop competency in working individually or as a team in tutorials, in the field and the laboratory.

Demonstrate professional behaviour in conduct with colleagues and staff, and the ethical handling of organisms.

## General Assessment Information

Students must **undertake and submit** all required elements to pass the unit.

**Internal (Day) enrolled students should pay particular care of activity and assessment deadlines**, which vary from deadlines set for Externally-enrolled students undertaking the unit. Extensions **will not** be granted if Internal (Day) students confuse deadlines.

A "Skills Achieved" portfolio certificate will be provided through iLearn as students achieve skills during the unit. A student's skills portfolio certificate can be used in support of CV building in 3rd year Capstone Units.

## Assessment Tasks

Name	Weighting	Due
<a href="#"><u>Australian Scientist Summary</u></a>	2%	11th March 2016 (Week 2)
<a href="#"><u>Lab/Tute Prep Activities</u></a>	10%	Weeks 1 to 12
<a href="#"><u>Practical Book Maintenance</u></a>	10%	Weeks 6 and 13
<a href="#"><u>Consultant Scientific Report</u></a>	16%	30th May 2016 (Week 12)
<a href="#"><u>Mid-term Exam</u></a>	20%	Week 6
<a href="#"><u>Final Exam</u></a>	30%	Week 13
<a href="#"><u>Skills Tests</u></a>	12%	Weeks 3, 5, 9 (or 7), 12

### Australian Scientist Summary

Due: **11th March 2016 (Week 2)**

Weighting: **2%**

Using information from the Australian Academy of Science's *Interviews with Australian Scientists*, students must summarise in their own words the contribution that their chosen scientist has made to Australian or International science, and why this is inspiring to the student. Minimum limitation 200 words - Maximum limitation 300 words. Students must submit their paragraph to Turnitin (for plagiarism assessment).

On successful completion you will be able to:

- Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).

- Develop competency in working individually or as a team in tutorials, in the field and the laboratory.

## Lab/Tute Prep Activities

Due: **Weeks 1 to 12**

Weighting: **10%**

Pre-class activities will be set prior to specific practicals and tutorials. Students must complete the activity prior to attending the practical or tutorial session for a grade to be awarded. Each activity will be assigned 1% of your final grade. Most pre-class activities will require reading (e.g. articles, risk assessments, prac notes), accessing material (e.g. videos and other media) and answering questions on-line, or the advance preparation of presentation slides or text for a tutorial.

On successful completion you will be able to:

- Articulate and practice the importance of health and safety in biological sciences (lab and field).
- Develop and demonstrate competencies in set up, operation and shutting down/clean-up of standard laboratory and field equipment.
- Develop and demonstrate competencies in standard laboratory techniques (e.g. dilutions, aseptic plating, imagery and measurement, labelling).
- Demonstrate competency in data collation, basic statistical analyses and representation by appropriate graphs in reports.
- Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).
- Develop competency in working individually or as a team in tutorials, in the field and the laboratory.
- Demonstrate professional behaviour in conduct with colleagues and staff, and the ethical handling of organisms.

## Practical Book Maintenance

Due: **Weeks 6 and 13**

Weighting: **10%**

Students will maintain an e-prac book during the course of the semester. During the mid-term and final exams the e-prac book will be assessed against set criteria that cover the completeness of activities and adherence to expected lab prac book conventions. The assessment of the e-prac book is worth 5% mid-term and 5% at the end of the semester.

On successful completion you will be able to:

- Articulate and practice the importance of health and safety in biological sciences (lab and field).
- Develop and demonstrate competencies in set up, operation and shutting down/clean-up of standard laboratory and field equipment.
- Develop and demonstrate competencies in standard laboratory techniques (e.g. dilutions, aseptic plating, imagery and measurement, labelling).
- Maintain an experimental notebook (field and lab); includes field observations with information related to environmental parameters and conditions.
- Demonstrate competency in data collation, basic statistical analyses and representation by appropriate graphs in reports.
- Describe and practice scientific methods from generating hypotheses and predictions through to following experimental procedures, and undertaking data collection.
- Develop competency in working individually or as a team in tutorials, in the field and the laboratory.

## Consultant Scientific Report

Due: **30th May 2016 (Week 12)**

Weighting: **16%**

Students must use a standard scientific report structure (outlined in class) to convey the experimental method and results of their field work survey undertaken on campus during practical sessions. Minimum limitation 1000 words - Maximum limitation 2000 words. Students must submit their report to Turnitin (for plagiarism assessment).

On successful completion you will be able to:

- Articulate and practice the importance of health and safety in biological sciences (lab and field).
- Develop and demonstrate competencies in set up, operation and shutting down/clean-up of standard laboratory and field equipment.
- Demonstrate competency in data collation, basic statistical analyses and representation by appropriate graphs in reports.
- Describe and practice scientific methods from generating hypotheses and predictions through to following experimental procedures, and undertaking data collection.
- Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).

- Develop competency in working individually or as a team in tutorials, in the field and the laboratory.
- Demonstrate professional behaviour in conduct with colleagues and staff, and the ethical handling of organisms.

## Mid-term Exam

Due: **Week 6**

Weighting: **20%**

Students will be examined on the skills they have experienced during the first half of the semester. Skills tested during the exam will include activities taken from material covered in lectures, practicals and tutorial sessions. The exam will occur during a student's normal practical class in Week 6.

On successful completion you will be able to:

- Develop and demonstrate competencies in set up, operation and shutting down/clean-up of standard laboratory and field equipment.
- Develop and demonstrate competencies in standard laboratory techniques (e.g. dilutions, aseptic plating, imagery and measurement, labelling).
- Demonstrate competency in data collation, basic statistical analyses and representation by appropriate graphs in reports.
- Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).
- Develop competency in working individually or as a team in tutorials, in the field and the laboratory.
- Demonstrate professional behaviour in conduct with colleagues and staff, and the ethical handling of organisms.

## Final Exam

Due: **Week 13**

Weighting: **30%**

Students will be examined on the skills they have experienced during the full semester. Skills tested during the exam will include activities taken from material covered in lectures, practicals and tutorial sessions. The exam will occur during a student's normal practical class in Week 13.

On successful completion you will be able to:

- Articulate and practice the importance of health and safety in biological sciences (lab and

field).

- Develop and demonstrate competencies in set up, operation and shutting down/clean-up of standard laboratory and field equipment.
- Develop and demonstrate competencies in standard laboratory techniques (e.g. dilutions, aseptic plating, imagery and measurement, labelling).
- Demonstrate competency in data collation, basic statistical analyses and representation by appropriate graphs in reports.
- Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).
- Develop competency in working individually or as a team in tutorials, in the field and the laboratory.
- Demonstrate professional behaviour in conduct with colleagues and staff, and the ethical handling of organisms.

## Skills Tests

Due: **Weeks 3, 5, 9 (or 7), 12**

Weighting: **12%**

Students will undertake four in-class skill assessment tasks during practical and/or tutorial sessions throughout the semester. Each test is worth 3%, thus contributing to a total of 12% of the final grade.

**Week 3 skills assessment (Lab-based):** Microscopy and digital imagery assessment task.

Students will need to show competence in using a dissecting microscope and Motic (TM) image software to capture appropriate images of insect anatomy.

**Week 5 skills assessment (Tutorial-based):** Journal article search task. Students will be required to search for a series of journal articles using the library multi-search interface.

**Week 9 (or 7) skills assessment (Lab-based):** Data collation, basic statistical analyses and representation by appropriate graphs. Students will use the data collected in Week 9 practicals on salinity impacts on Eucalyptus species to visually represent data and statistically test for differences.

**Week 12 skills assessment (Lab-based):** Micro-pipette handling skill. Students will be required to show competence in micro-pipetting techniques and calculating concentrations by generating a standard curve using spectrophotometers and Excel (TM).

On successful completion you will be able to:

- Develop and demonstrate competencies in set up, operation and shutting down/clean-up of standard laboratory and field equipment.



- Develop and demonstrate competencies in standard laboratory techniques (e.g. dilutions, aseptic plating, imagery and measurement, labelling).
- Demonstrate competency in data collation, basic statistical analyses and representation by appropriate graphs in reports.
- Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).
- Develop competency in working individually or as a team in tutorials, in the field and the laboratory.
- Demonstrate professional behaviour in conduct with colleagues and staff, and the ethical handling of organisms.

## Delivery and Resources

### Lectorials.

A one hour lectorial is presented each Tuesday of the semester. A repeat lectorial is provided on Wednesday to accommodate student numbers and timetables. Lectorials are interactive presentations provided through the format "*Lecture Tools*" accessible through the BIOL116 iLearn portal. *Lecture Tools* enable students to interact immediately via their computer or alternative mobile internet platform (e.g. surface, iPad, mobile) to take notes on the slides during class, print both slides and notes, vote or respond instantaneously to in-class quiz/questions that are posted, ask questions and signal slides that need additional follow up. Lectorials are recorded on ECHO360, principally for students enrolled in the External Offering of BIOL116 or for revision purposes. ECHO360 recordings do not capture the interactive learning activities made possible through attendance and the use of *Lecture Tools*. Students are highly recommended to attend lectorials to enhance their learning experience in this unit.

### Tutorials.

A one-hour tutorial class is presented each week. Tutorials are formulated around both independent and team activities that focus on problem solving and development of resource inquiry and writing skills. Students are encouraged to bring their computer or alternative mobile internet platform (e.g. surface, iPad, mobile) to tutorials to assist with search activities or the use of spreadsheet software (e.g. Excel (TM)). There are two pre-tutorial activities where students must come prepared to their class (Weeks 8 and 10) and a Skills test in Week 5. Tutorial classes are fixed and cannot be changed once selected. Tutorial attendance is compulsory and an attendance roll will be taken.

### Practicals.

A 2.5 hour practical is presented each week and in the majority of cases there is a short pre-prac activity to complete prior to entering the class. As the unit is focused on a student's handling of basic equipment in the lab/field, and development of technical and analytical skills, students

will be expected to maintain an e-prac book. During the mid-term and the final exams the e-prac book will be assessed against set criteria that cover the completeness of activities and adherence to expected conventions described in class. The e-prac book will be assessed after students have undertaken their mid-term and final practical exams. There are three skill tests (Weeks 3, 9 and 12) and two practicals exams (Week 6 and 13) all undertaken during set practicals classes.

- Students MUST WEAR ENCLOSED FOOTWEAR to all practical sessions.
- Lab coats are not compulsory but are encouraged. In the event a lab coat is required for any activity students will be informed in advance and have the opportunity to purchase a disposable lab apron (~\$2) in class should they not have a lab coat.
- All other personal protection such as gloves and safety glasses will be supplied as required by our approved risk assessment procedures.
- There are no dissections of animals in BIOL116, however, we do handle insects and take the ethical handling of all organisms very seriously.
- Students that have a medically-assessed allergy to gloves (latex, plastics, nitrile), pollen or crustaceans, or have a disability should make staff aware in advance so that alternative equipment and activities for certain practicals can be prepared in advance to ensure completion of the unit. Contact: [biol116@mq.edu.au](mailto:biol116@mq.edu.au) and in the subject line use the flag: *Confidential Prac Allergy Notification*.
- Due to University policy on Workplace Health and Safety, access to all laboratory classes will be closed 10 minutes after the start time. Late entries will not be permitted under any circumstances.
- Practical attendance is compulsory and an attendance roll will be taken.

## Exams.

BIOL116 has practical exams built into the semester program (Weeks 6 and 13) and does not hold exams in the official exam period of a semester. Practical exams will cover the following:

- Week 6 Prac Exam will cover Lecture, Tutorial, Pre-prac activities and Practical experiences or material covered in the first 6 weeks of the term. Students will be tested on equipment use or need to answer technique or analytical questions at ~6 stations.
- Week 13 Prac Exam will cover Lecture, Tutorial, Pre-prac activities, and Practical material or experiences across the whole semester. Students will be tested on equipment use or need to answer technique or analytical questions at ~8 stations.
- At the end of the exam stations for both the mid-term and final exams, students will show their on-line e-prac book to a separate marker for grading against 5 criteria that cover the completeness of class activities and adherence to expected lab note book conventions.

# Unit Schedule

## BIOL116 Timetable

Draft 22/12/15

(subject to minor revision in Feb 2016)

Uni Week	Lectorial	Pre-Tute Activity and Tutorial	Pre-Prac Activity and Practical	Assessments
1	Course introduction (How to succeed in BIOL116 - don't miss this lecture!)	Working in a Team Environment	<i>On-line Safety Quiz (Must be completed to gain access to Lab in Week 2).</i>  No Practical this week	
2	"Observe Nature not (Face) Books!"	Locating Resources	<i>Pollen pre-prac activity (due prior to Week 2 prac session).</i>  Microscopy basics: compound microscopes (pollen in honey)	1. Australian Scientist Summary (due 11th March, 2016).
3	Originality in a sea of ideas.	Dissecting scientific papers.	<i>Mosquito pre-prac activity (due prior to Week 3 prac session).</i>  Microscopy basics: dissecting microscopes (Backyard mosquitoes).  Skills Test 1.	2. Skills Test No 1. (in Week 3 practical session).
4	The Scientific Method	<i>On-line literature search game (due 9am, Tuesday 29th March, 2016).</i>  No Tutorial this week	No Practical this week	
<b>Easter Break</b>	<b>25th to 28th March, 2016</b>			
5	Which graph when?	Applying the Scientific Method.  Skills Test 2.	<i>Crickets pre-prac activity (due prior to Week 5 prac session).</i>  Hot and Hopyy Crickets!	3. Skills Test No 2. (in Week 5 tutorial session).
6	Statistics and why you need 'em!	Samples sizes in statistics.	MID SEMESTER PRACTICAL EXAM	4. e-prac book assessment no 1. (at end of mid-term exam).

Uni Week	Lectorial	Pre-Tute Activity and Tutorial	Pre-Prac Activity and Practical	Assessments
Mid-Semester Break	11th April - 25th April (ANZAC DAY), 2016.			
7	Out of the Lab and into the Field.	How to structure and formulate a scientific report. Part 1. Structure.	<i>Pre-prac Fieldwork participation form completion (required for field work in Week 7).</i>  Field Techniques (insect-flower interactions).	
8	Aseptic laboratory techniques	<i>Pre-tute activity: Method section outline required for Week 8 tutorial.</i>  How to structure and formulate a scientific report. Part 2. Methods.	<i>Pipette pre-prac activity (due prior to Week 8 prac session).</i>  The "99.9%* germ free" practical.	
9	Hitting the bullseye - Precision and Accuracy	Preparing Risk Assessments	<i>Eucalyptus pre-prac activity (due prior to Week 9 prac session).</i>  Salinity stress on Eucalyptus seedlings.  Skills Test 3.	5. Skills Test No 3. (in Week 9 prac session).
10	To "R" or not to "R" - that is the question?	No Tutorial	FIELD WORK PRAC ON CAMPUS.	
11	Roots and Keys.	The answer is "R".	The " * 0.1% germs" practical and advice session on field work report.	
12	The Price is Right.	<i>Pre-Tute activity Two-slide powerpoint, 5- minute group presentation (due in Week 10 tutorial).</i>  Field Work Reflection Group Presentation.	<i>Standard Curve pre-prac activity (due prior to Week 12 prac session).</i>  Pipetting and Standard Curves Practical  Skills Test No. 4	6. Skills Test No. 4 (in Week 12 prac).
13	Where to from here? Unit summary.	No Tutorial.	FINAL EXAM	7. e-prac book assessment no 2. (at end of final exam).

## 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](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

**New Assessment Policy in effect from Session 2 2016** [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html). For more information visit [http://students.mq.edu.au/events/2016/07/19/new\\_assessment\\_policy\\_in\\_place\\_from\\_session\\_2/](http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/)

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.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](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](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/](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.mq.edu.au](http://ask.mq.edu.au).

## Questions about BIOL116?

To ask a question specific to BIOL116 please use the dedicated e-mail address: [biol116@mq.edu.au](mailto:biol116@mq.edu.au). Your e-mail will be answered by our 100-level administrator Dr Koa Webster or directed to the appropriate BIOL116 tutor or the convenors Dr Leanne Armand or Prof. Mariella Herberstein as appropriate.

## 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](http://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](http://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/](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

### Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

### Learning outcomes

- Develop and demonstrate competencies in standard laboratory techniques (e.g. dilutions, aseptic plating, imagery and measurement, labelling).
- Maintain an experimental notebook (field and lab); includes field observations with information related to environmental parameters and conditions.
- Describe and practice scientific methods from generating hypotheses and predictions through to following experimental procedures, and undertaking data collection.
- Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).

### Assessment tasks

- Australian Scientist Summary
- Lab/Tute Prep Activities
- Practical Book Maintenance
- Consultant Scientific Report

## Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

### Learning outcomes

- Articulate and practice the importance of health and safety in biological sciences (lab and field).
- Develop and demonstrate competencies in set up, operation and shutting down/clean-up of standard laboratory and field equipment.
- Develop and demonstrate competencies in standard laboratory techniques (e.g. dilutions, aseptic plating, imagery and measurement, labelling).
- Maintain an experimental notebook (field and lab); includes field observations with information related to environmental parameters and conditions.
- Describe and practice scientific methods from generating hypotheses and predictions through to following experimental procedures, and undertaking data collection.
- Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).
- Develop competency in working individually or as a team in tutorials, in the field and the laboratory.
- Demonstrate professional behaviour in conduct with colleagues and staff, and the ethical handling of organisms.

### Assessment tasks

- Australian Scientist Summary
- Lab/Tute Prep Activities
- Practical Book Maintenance
- Consultant Scientific Report
- Mid-term Exam
- Final Exam
- Skills Tests

## Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

### Learning outcomes

- Articulate and practice the importance of health and safety in biological sciences (lab and field).
- Develop and demonstrate competencies in set up, operation and shutting down/clean-up of standard laboratory and field equipment.
- Develop and demonstrate competencies in standard laboratory techniques (e.g. dilutions, aseptic plating, imagery and measurement, labelling).
- Maintain an experimental notebook (field and lab); includes field observations with information related to environmental parameters and conditions.
- Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).
- Demonstrate professional behaviour in conduct with colleagues and staff, and the ethical handling of organisms.

### Assessment tasks

- Lab/Tute Prep Activities
- Practical Book Maintenance
- Mid-term Exam
- Final Exam
- Skills Tests

## Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.



This graduate capability is supported by:

## **Learning outcomes**

- Articulate and practice the importance of health and safety in biological sciences (lab and field).
- Develop and demonstrate competencies in set up, operation and shutting down/clean-up of standard laboratory and field equipment.
- Develop and demonstrate competencies in standard laboratory techniques (e.g. dilutions, aseptic plating, imagery and measurement, labelling).
- Maintain an experimental notebook (field and lab); includes field observations with information related to environmental parameters and conditions.
- Demonstrate competency in data collation, basic statistical analyses and representation by appropriate graphs in reports.
- Describe and practice scientific methods from generating hypotheses and predictions through to following experimental procedures, and undertaking data collection.
- Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).

## **Assessment tasks**

- Australian Scientist Summary
- Practical Book Maintenance
- Consultant Scientific Report
- Mid-term Exam
- Final Exam
- Skills Tests

## **Critical, Analytical and Integrative Thinking**

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

## **Learning outcomes**

- Develop and demonstrate competencies in standard laboratory techniques (e.g. dilutions, aseptic plating, imagery and measurement, labelling).

- Maintain an experimental notebook (field and lab); includes field observations with information related to environmental parameters and conditions.
- Demonstrate competency in data collation, basic statistical analyses and representation by appropriate graphs in reports.
- Describe and practice scientific methods from generating hypotheses and predictions through to following experimental procedures, and undertaking data collection.
- Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).

## **Assessment tasks**

- Australian Scientist Summary
- Lab/Tute Prep Activities
- Practical Book Maintenance
- Consultant Scientific Report
- Mid-term Exam
- Final Exam
- Skills Tests

## **Problem Solving and Research Capability**

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

## **Learning outcomes**

- Develop and demonstrate competencies in set up, operation and shutting down/clean-up of standard laboratory and field equipment.
- Develop and demonstrate competencies in standard laboratory techniques (e.g. dilutions, aseptic plating, imagery and measurement, labelling).
- Maintain an experimental notebook (field and lab); includes field observations with information related to environmental parameters and conditions.
- Demonstrate competency in data collation, basic statistical analyses and representation by appropriate graphs in reports.
- Describe and practice scientific methods from generating hypotheses and predictions through to following experimental procedures, and undertaking data collection.

- Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).
- Develop competency in working individually or as a team in tutorials, in the field and the laboratory.

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## **Effective Communication**

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

## **Learning outcomes**

- Articulate and practice the importance of health and safety in biological sciences (lab and field).
- Develop and demonstrate competencies in standard laboratory techniques (e.g. dilutions, aseptic plating, imagery and measurement, labelling).
- Maintain an experimental notebook (field and lab); includes field observations with information related to environmental parameters and conditions.
- Demonstrate competency in data collation, basic statistical analyses and representation by appropriate graphs in reports.
- Describe and practice scientific methods from generating hypotheses and predictions through to following experimental procedures, and undertaking data collection.
- Locate, synthesize, appropriately reference (Harvard style) and communicate scientific information, concepts and your own data through oral, visual and written formats (e.g. class tutorials, report, practical exam).
- Develop competency in working individually or as a team in tutorials, in the field and the

laboratory.

- Demonstrate professional behaviour in conduct with colleagues and staff, and the ethical handling of organisms.

## Assessment tasks

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## Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

## Learning outcomes

- Maintain an experimental notebook (field and lab); includes field observations with information related to environmental parameters and conditions.
- Develop competency in working individually or as a team in tutorials, in the field and the laboratory.
- Demonstrate professional behaviour in conduct with colleagues and staff, and the ethical handling of organisms.

## Assessment tasks

- Australian Scientist Summary
- Consultant Scientific Report

## Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

## **Learning outcomes**

- Articulate and practice the importance of health and safety in biological sciences (lab and field).
- Maintain an experimental notebook (field and lab); includes field observations with information related to environmental parameters and conditions.
- Develop competency in working individually or as a team in tutorials, in the field and the laboratory.
- Demonstrate professional behaviour in conduct with colleagues and staff, and the ethical handling of organisms.

## **Assessment task**

- Consultant Scientific Report