

BIOL388 Advanced Science (Biology) 3

FY1 Day 2018

Dept of Biological Sciences

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General Information

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Distinguised Professor Michael Gillings michael.gillings@mq.edu.au Contact via 9850 8199 E8A271 by appointment

PACE internship co-ordinator Kathryn Korbel kathryn.korbel@mq.edu.au by appointment

Credit points 3

Prerequisites

39cp including (BIOL188 and (3cp(D) of BIOL units at 200 level) and (3cp(D) of BIOL or GEOS units at 200 level)) and admission to BAdvSc and permission by special approval

Corequisites

Co-badged status

Unit description

This tutorial unit meets for one hour weekly to discuss hot topics and recent research advances in biology with a variety of scientists from a diverse background. Students undertake a research internship in biology and produce a report (in scientific format) on their findings at the annual conference.

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:

- solve problems in a real-world context using discipline-specific knowledge and skills acquired throughout the Biology program.
- employ the tools, methodologies, language and conventions of Biology to develop and test new ideas.
- learn in a responsible, critically-reflective, self-directed and self-motivated manner.
- work effectively and ethically in a multifaceted scientific environment.
- summarise and effectively communicate scientific ideas to different audiences map discipline-specific knowledge, ethics, negotiation skills, cross-cultural and
- interpersonal skills to the requirements of a range of future career paths.

General Assessment Information

Unit completion requirements

Students must complete all the assessment tasks. A <u>Satisfactory</u> (or <u>Participated</u>) grade is required in each assessment task in order to pass this subject.

Assessment descriptions

Student learning in this unit is evaluated using two different systems:

Participation tasks are graded as <u>Participated</u> or <u>Did not participate</u> to indicate your level of engagement with learning opportunities. The weekly discussion groups and the weekly online question assessment track active participation rather than performance level. Similarly, active participation is required during the Big Science Day out project.

Feedback assessment tasks allow evaluations of capability. Your written paper on a selected hot topic and your internship presentation are feedback assessments. High standards are expected. You will be provided with feedback pointing to strengths and to potential for improvement in these assessments. They will be graded as <u>Satisfactory</u> or <u>Unsatisfactory</u>.

Preparation for, and Participation in Discussion Groups

Readings for each week's meeting will be posted on the Advanced Biology iLearn space, along with at least one discussion question to think about. These readings and questions will be provided by the week's presenter.

You will be required to prepare for the discussion groups by reading the required articles. Each week, you must then provide a brief (max 500 words) written response on an aspect of the discussion question posed. The question will be posted on iLearn and your response can be submitted through the iLearn blog space. You can submit your answer to the discussion question anytime until 9 am on the morning before the meeting. This gives other participants opportunity to look at responses before the discussion meeting.

Attendance at discussion groups is compulsory and a roll will be marked. It is extremely important to prepare for each week's discussion group. Students who have not read the required material may be asked to leave by the presenter, in which case they will be marked as absent. All students are expected to take part in the discussion.

Participation in group project and reflection upon it

Scoping phase. During this phase the challenge will be to identify aspects of biology that are interesting to non-specialists, that are well-founded in current research and that can be successfully conveyed via the 'Big Science Day Out Race". Your participation will be assessed via contributions to group activities (summaries and project showcase) and via observations by staff supervising the activities.

Internship in research group or facility

Internships involve spending a minimum of 60 hours in an active research group or facility or field project (there is no maximum duration). The internship arrangement is expected to benefit both the student and the research group. In other words students should be playing an integrated role in a targeted research project. Internships for BIOL388 may be undertaken in a research group within the Department of Biological Sciences at Macquarie University, or with a suitable external organisation. Internships must be approved by the Convenor.

Please check the BIOL388 Internships folder on iLearn regularly for further information, internship opportunities, and required documentation. Students are advised to begin contacting possible internship supervisors as soon as possible. You are not required to hand in a proposal for assessment, but it is strongly advised that in consultation with the supervisor, you prepare a document outlining hypotheses, project objectives, your role in the project, proposed methodology and a timeline.

You must fill in the supplied partner information form (available on iLearn), detailing your research supervisor, research lab group or external organisation. There will also be a PACE online form to complete; instructions on how to access this will be provided on iLearn. The forms are due at the start of May.

Students wishing to complete internships with overseas PACE partners may be required to submit PACE documentation at an earlier date. Please see the convenor as soon as possible to discuss this.

You will present a seminar of 12 minutes duration on the outcome(s) of your research internship project. You should assume that your audience has a basic understanding of biology, but are not specialists in the topic area. The talks will be presented at the Advanced Biology Conference during **Week 11, Sem 2** from **1-4 pm**. The conference will be organized and run by students. Students will also judge the quality of the presentations using a standardized marking sheet.

Assignment submission

Written assignments are to be submitted via iLearn. Your work may be submitted to antiplagiarism detection software (Turnitin) via iLearn. Your work will automatically be compared to work of your classmates, previous students from Macquarie and other universities, with material available on the Internet, both freely available and subscription-based electronic journals and book chapters. The results will be sent to the unit convenor, who will analyse them with reference to the University's Policy on Academic Honesty.

Extensions and penalties

Deadlines for assignments are not negotiable. Late assignments will be penalised. Extensions are granted only on grounds of illness or misadventure, and appropriate supporting documentation must be submitted. **All applications for special consideration or extension must be sought before the due date.**

Work submitted after 3 weeks beyond the due date, or the date for which an extension has been given, will not be accepted. If you are having problems completing an assignment, please contact the Convenor as soon as possible.

Assessment Tasks

Name	Weighting	Hurdle	Due
weekly discussions	35%	No	Weekly, 9 am each Tuesday
group project, scoping phase	15%	No	Week 8
internship research project	35%	No	2 Oct 2018
presentation about internship	15%	No	23 Oct 2018

weekly discussions

Due: Weekly, 9 am each Tuesday Weighting: 35%

Short blog response to a discussion question relating to each week's topics. Participation in weekly discussions.

On successful completion you will be able to:

- employ the tools, methodologies, language and conventions of Biology to develop and test new ideas.
- learn in a responsible, critically-reflective, self-directed and self-motivated manner.
- · summarise and effectively communicate scientific ideas to different audiences
- map discipline-specific knowledge, ethics, negotiation skills, cross-cultural and interpersonal skills to the requirements of a range of future career paths.

group project, scoping phase

Due: Week 8 Weighting: 15% assessed via (a) contributions to the group (b) observations of your contribution by Staff and Department mentors during the project

On successful completion you will be able to:

- solve problems in a real-world context using discipline-specific knowledge and skills acquired throughout the Biology program.
- employ the tools, methodologies, language and conventions of Biology to develop and test new ideas.
- learn in a responsible, critically-reflective, self-directed and self-motivated manner.
- work effectively and ethically in a multifaceted scientific environment.
- summarise and effectively communicate scientific ideas to different audiences
- map discipline-specific knowledge, ethics, negotiation skills, cross-cultural and interpersonal skills to the requirements of a range of future career paths.

internship research project

Due: 2 Oct 2018

Weighting: 35%

Experience in the conduct of a research project and in working within a collaborative group. Assessed via report from lab supervisor.

On successful completion you will be able to:

- solve problems in a real-world context using discipline-specific knowledge and skills acquired throughout the Biology program.
- learn in a responsible, critically-reflective, self-directed and self-motivated manner.
- work effectively and ethically in a multifaceted scientific environment.
- map discipline-specific knowledge, ethics, negotiation skills, cross-cultural and interpersonal skills to the requirements of a range of future career paths.

presentation about internship

Due: 23 Oct 2018 Weighting: 15%

12 min exposition of the research topic and appraisal of what was learned

On successful completion you will be able to:

- employ the tools, methodologies, language and conventions of Biology to develop and test new ideas.
- · summarise and effectively communicate scientific ideas to different audiences

• map discipline-specific knowledge, ethics, negotiation skills, cross-cultural and interpersonal skills to the requirements of a range of future career paths.

Delivery and Resources

This unit is for students enrolled in the Advanced Science (Biology) Program. The Advanced Biology Program offers expansion and enrichment of the standard undergraduate curriculum. It is designed for students who have good grades in their regular Biology units and who have energy and curiosity to spare.

During the year, students will meet with diverse academics, and be exposed to the advancing frontiers of research. Students will be challenged to think about topics where biological knowledge is changing, and advancing rapidly.

Learning and thinking about how new knowledge is acquired will help students who might go on to become career researchers, but it will also be of great benefit to students who enter other fields, such as media, politics, government or business.

The first year (BIOL188) and third year (BIOL388) units meet for at least one hour on a weekly basis throughout the year. The timetable has a two hour session booked each week, so that we can extend discussions if the need arises. Most weeks will be discussions about hot topics and recent research advances in biology. These discussions will be led by researchers who work actively in these areas. Topic areas will include medical science, molecular biology, synthetic biology, ecology, evolution, palaeontology, and biology in the media, to name a few.

Students will also participate in a group project to develop research-based material for Science Week at the Royal Botanic Garden as part of the 'Big Science Day Out'. This is an opportunity to meet researchers from a science based industry and interpret research activities for communication to the general public. In some weeks, activities will revolve around this project.

- Successful completion of this unit will earn you 3 credit points.
- The unit is offered internally for a full year (FY1)
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Learning and Teaching strategy

Overall objectives of this unit are:

- 1. understanding issues near the cutting edge of biological research, where knowledge remains uncertain; critical assessment of evidence
- 2. communication in different forms and with different audiences
- 3. experience in formulating a research question and executing the experiment or data collection; problem solving during the process
- 4. reflection on the process of real research, where answers are not known in advance, and on the social functioning of research groups

Learning and Teaching Activities

Weekly meeting

In most weeks these will be held jointly with BIOL188. In these weeks, the meeting will revolve around discussion of a particular hot topic. A guest contributor (mostly research leaders, sometimes people from other backgrounds) will provide readings beforehand and will lead the discussion. A week-by-week schedule will be put up on the iLearn site as speakers are confirmed. You are required to contribute comments to the iLearn blog by 9 am on the day of the meeting, and to be ready for cogent discussion at the meeting.

Group project

Coordinated by Michelle Power in collaboration with Royal Botanic Gardens Sydney. The project has the purpose of developing the "The Big Science Day Out" that will be offered to school students and other community guests visiting the Botanic Garden during the Sydney Science Festival and National Science Week. Note important dates for this activity in the iLearn schedule.

Internship

An internship with a research group or facility. This is the PACE activity for the Advanced Biology Program. At the first meeting of the year, PACE staff will explain more about how this will be organised.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://staff.m q.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-centr al). 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 <u>Student Policy Gateway</u> (htt ps://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 (http

s://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/p olicy-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 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 <u>eStudent</u>. For more information visit <u>ask.m</u> <u>q.edu.au</u>.

Student Support

Macquarie University provides a range of support services for students. For details, visit <u>http://stu</u> dents.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 <u>http://www.mq.edu.au/about_us/</u>offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the <u>Acceptable Use of IT Resources Policy</u>. 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 outcome

· summarise and effectively communicate scientific ideas to different audiences

Assessment tasks

- · weekly discussions
- group project, scoping phase
- internship research project
- · presentation about internship

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

- employ the tools, methodologies, language and conventions of Biology to develop and test new ideas.
- · learn in a responsible, critically-reflective, self-directed and self-motivated manner.
- work effectively and ethically in a multifaceted scientific environment.
- · summarise and effectively communicate scientific ideas to different audiences
- map discipline-specific knowledge, ethics, negotiation skills, cross-cultural and interpersonal skills to the requirements of a range of future career paths.

Assessment tasks

- · weekly discussions
- group project, scoping phase
- · internship research project

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 outcome

• learn in a responsible, critically-reflective, self-directed and self-motivated manner.

Assessment tasks

- weekly discussions
- group project, scoping phase
- · internship research project
- presentation about internship

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

- solve problems in a real-world context using discipline-specific knowledge and skills acquired throughout the Biology program.
- employ the tools, methodologies, language and conventions of Biology to develop and test new ideas.
- map discipline-specific knowledge, ethics, negotiation skills, cross-cultural and interpersonal skills to the requirements of a range of future career paths.

Assessment tasks

- · weekly discussions
- group project, scoping phase
- · internship research project
- · presentation about internship

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

- solve problems in a real-world context using discipline-specific knowledge and skills acquired throughout the Biology program.
- learn in a responsible, critically-reflective, self-directed and self-motivated manner.
- · summarise and effectively communicate scientific ideas to different audiences
- map discipline-specific knowledge, ethics, negotiation skills, cross-cultural and interpersonal skills to the requirements of a range of future career paths.

Assessment tasks

- weekly discussions
- group project, scoping phase
- internship research project
- presentation about internship

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

- solve problems in a real-world context using discipline-specific knowledge and skills acquired throughout the Biology program.
- employ the tools, methodologies, language and conventions of Biology to develop and test new ideas.
- learn in a responsible, critically-reflective, self-directed and self-motivated manner.

Assessment tasks

- weekly discussions
- group project, scoping phase
- · internship research project
- presentation about internship

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

- employ the tools, methodologies, language and conventions of Biology to develop and test new ideas.
- learn in a responsible, critically-reflective, self-directed and self-motivated manner.
- work effectively and ethically in a multifaceted scientific environment.
- · summarise and effectively communicate scientific ideas to different audiences
- map discipline-specific knowledge, ethics, negotiation skills, cross-cultural and interpersonal skills to the requirements of a range of future career paths.

Assessment tasks

- · weekly discussions
- group project, scoping phase
- internship research project
- · presentation about internship

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

- solve problems in a real-world context using discipline-specific knowledge and skills acquired throughout the Biology program.
- learn in a responsible, critically-reflective, self-directed and self-motivated manner.
- · work effectively and ethically in a multifaceted scientific environment.
- summarise and effectively communicate scientific ideas to different audiences

Assessment tasks

- · weekly discussions
- group project, scoping phase
- internship research project

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

- solve problems in a real-world context using discipline-specific knowledge and skills acquired throughout the Biology program.
- learn in a responsible, critically-reflective, self-directed and self-motivated manner.
- work effectively and ethically in a multifaceted scientific environment.
- · summarise and effectively communicate scientific ideas to different audiences

Assessment tasks

- · weekly discussions
- group project, scoping phase
- · internship research project

Group project

The group project was previously held at Taronga Zoo (Wild Science Race). For this offering we will work with the Royal Botanic Gardens and Australian Museum to deliver the 'Big Science Day Out'