



# BIOL602

## Evolution

S1 External 2019

*Dept of Biological Sciences*

### Contents

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<u>General Information</u>	2
<u>Learning Outcomes</u>	2
<u>General Assessment Information</u>	3
<u>Assessment Tasks</u>	4
<u>Delivery and Resources</u>	8
<u>Unit Schedule</u>	9
<u>Policies and Procedures</u>	9
<u>Graduate Capabilities</u>	11
<u>Changes from Previous Offering</u>	15

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Unit Convenor

Simon Griffith

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Tuesday 9-5

Kate Barry

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Credit points

4

Prerequisites

Admission to MConsBiol or GradDipConsBiol or GradCertConsBiol or MSc or MScInnovation

Corequisites

Co-badged status

BIOL602

Unit description

This unit deals coherently with the unifying theory of the biological sciences - evolution. Evolutionary biology helps us to understand the history of life on earth, and the inter-relationships between different groups of organisms. The unit will examine how evolutionary processes create biodiversity in the natural world with respect to organismal structure, physiology, and behaviour. The unit will also demonstrate how an evolutionary framework informs contemporary issues such as the emergence of pandemic disease, the human obesity crisis, and selection as a result of global climate change.

## 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:

Define evolution and distinguish micro- and macroevolution, and natural and sexual selection

- Identify and contrast different concepts of species
- Interpret cladograms to infer evolutionary relationships among organisms
- Apply scientific techniques, including microscopy, measurement, and observation, to [collect data and] answer questions in evolutionary biology
- Analyse collected data using [simple] statistics and present it graphically
- Evaluate the different approaches to studying evolution, including [using] the fossil record, experimental biology, field biology, and genomics
- Argue the importance of evolution in addressing contemporary global issues, with support from the scientific literature
- Demonstrate foundational learning skills including active engagement in the learning process

## General Assessment Information

In order to be eligible to receive a pass (P) or greater in this unit, it is incumbent upon you to make a genuine effort at **completing all assessment tasks** and must achieve a pass mark (50%) across the whole course. In particular we believe that attendance at the practical classes is an important component of the learning, and as such it is a hurdle to course completion.

## Practical Classes

Due: **During On campus session (23rd and 24th April)** Weighting: **0%** **This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

You must attend and participate in at least 6 of the 9 practical classes given during the on campus sessions to pass this unit. **This is a hurdle requirement, meaning that you must participate in at least this many of the practical classes to pass the unit.**

This Assessment Task relates to the following Learning Outcomes:

- Demonstrate foundational learning skills including active engagement in the learning process

### Extensions, penalties and special consideration

Late assignments will attract a penalty at the rate of **5%** of the total mark allocated for the assignment **per day** past the due date. The deadlines for assignments are **not negotiable**. You will only avoid penalties if you can produce a valid medical certificate or a letter with appropriate supporting documents outlining serious extenuating circumstances. All applications for special consideration or extension must be sought via the Faculty of Science through the student portal *before the due date* unless this is impossible. In addition you should also notify the course convener, Prof. Simon Griffith, via Dialogue on iLearn.

### Final Exam as a hurdle

If you receive special consideration for the final exam, a supplementary exam will be scheduled

in the interval between the regular exam period and the start of the next session. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. You can check the supplementary exam information page on FSE101 in iLearn for dates, and approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

A **hurdle requirement** is an activity for which a minimum level of performance or participation is a condition of passing a unit. In BIOL262/602 the final exam is the hurdle assessment and the university has stipulated that if you have made a serious attempt but failed to pass a hurdle requirement you will be given a second chance to attain a passing grade. The pass mark for the final exam is 45%. Students who have a mark of 35 to 44% will be able to sit the exam again. The exam papers for the first and second attempts will be the same in style (i.e. multiple choice and short answer questions) but the actual questions will be different.

If you are given a second opportunity to sit the final examination as a result of failing to meet the minimum mark required, you will be offered that chance during the supplementary examination period and will be notified of the exact day and time after the publication of final results for the unit .

### The return of assessment tasks

Assessed assignments will be returned with feedback (where appropriate) via iLearn and marks given in Gradebook.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#"><u>Weekly reading material</u></a>	15%	No	Weekly 1-12
<a href="#"><u>Online Quizzes</u></a>	5%	No	After 7 days
<a href="#"><u>Practical Reports</u></a>	10%	No	One week after posting
<a href="#"><u>News article evaluation</u></a>	10%	No	15th April
<a href="#"><u>Research project plan</u></a>	20%	No	25th May
<a href="#"><u>Practical Participation</u></a>	0%	Yes	By week 13
<a href="#"><u>Final Exam</u></a>	40%	Yes	Exam Period

### Weekly reading material

Due: **Weekly 1-12**

Weighting: **15%**

Each week, material will be presented on iLearn that will require you to spend a minimum of two hours reading/ listening / watching, and then answering some questions in an online quiz. This content will be chosen to improve your understanding of evolutionary processes and will promote ongoing engagement with the subject. The material will be posted along with the assessment task on Wednesday of each week, and each assessment must have been completed within a two week deadline. This material will require a significant investment in your time each week, and will be worth 15% of the course marks and also be heavily assessed during the final exam.

On successful completion you will be able to:

- Define evolution and distinguish micro- and macroevolution, and natural and sexual selection
- Identify and contrast different concepts of species
- Interpret cladograms to infer evolutionary relationships among organisms
- Evaluate the different approaches to studying evolution, including [using] the fossil record, experimental biology, field biology, and genomics
- Demonstrate foundational learning skills including active engagement in the learning process

## Online Quizzes

Due: **After 7 days**

Weighting: **5%**

In Week 6 and Week 12 on iLearn there will be a range of questions based on the course content delivered in lectures in the preceding weeks. This will remain open for assessment for the next seven days (closing at 11pm on the Friday after it has been posted). This material will help you to review course content, and assess your understanding of the key concepts. Questions will be in multiple-choice format. An equal number of marks will be available for each of the four quizzes, and altogether will make up 5% of the course marks. The material will remain available online throughout the duration of the course but responses after the weekly deadline has passed will not be credited.

On successful completion you will be able to:

- Define evolution and distinguish micro- and macroevolution, and natural and sexual selection
- Identify and contrast different concepts of species
- Interpret cladograms to infer evolutionary relationships among organisms
- Apply scientific techniques, including microscopy, measurement, and observation, to [collect data and] answer questions in evolutionary biology
- Analyse collected data using [simple] statistics and present it graphically
- Evaluate the different approaches to studying evolution, including [using] the fossil

record, experimental biology, field biology, and genomics

- Argue the importance of evolution in addressing contemporary global issues, with support from the scientific literature

## Practical Reports

Due: **One week after posting**

Weighting: **10%**

Each practical will be assessed through the completion of an assessment task on iLearn. The assessment task on iLearn will be opened either during the practical, or in the days after it, and your completion of the assessment tasks will be dependent upon the notes that you have taken for yourself during the practical class. You should therefore maintain a comprehensive notebook which documents all of the work and discussion during the practical sessions. Thus, all notes, records, illustrations and results should be entered into your practical book during class. We recommend that you use an A4 ring-binder with lined paper for notes and blank paper for diagrams. The practical assessment task on iLearn will remain open for one week and then be closed. In total, five practical classes will be assessed in this way, and an equal number of marks will be available for each.

On successful completion you will be able to:

- Define evolution and distinguish micro- and macroevolution, and natural and sexual selection
- Identify and contrast different concepts of species
- Interpret cladograms to infer evolutionary relationships among organisms
- Apply scientific techniques, including microscopy, measurement, and observation, to [collect data and] answer questions in evolutionary biology
- Analyse collected data using [simple] statistics and present it graphically
- Argue the importance of evolution in addressing contemporary global issues, with support from the scientific literature
- Demonstrate foundational learning skills including active engagement in the learning process

## News article evaluation

Due: **15th April**

Weighting: **10%**

This assignment will focus on the coverage of stories related to evolutionary biology in the popular media. A library of short news stories will be compiled from the popular press and you will select three stories and write a report of around 800 words to summarise your exploration of the underlying science behind the stories. The report will be structured around the full details to be posted on iLearn in Week 4.

On successful completion you will be able to:

- Define evolution and distinguish micro- and macroevolution, and natural and sexual selection
- Identify and contrast different concepts of species
- Analyse collected data using [simple] statistics and present it graphically
- Evaluate the different approaches to studying evolution, including [using] the fossil record, experimental biology, field biology, and genomics
- Argue the importance of evolution in addressing contemporary global issues, with support from the scientific literature

## Research project plan

Due: **25th May**

Weighting: **20%**

In this major written assessment you will be required to conduct literature research of the primary literature in order to map-out a research project addressing a major evolutionary question. This assessment will build upon a lot of discussion of experimental design and different research techniques in the lectures and pracs

This written report will be due towards the end of the course and build on knowledge acquired from the lecture material and practicals up to that point. The full details of the assessment task will be released on iLearn in Week 7, and it will be due for submission in Week 11. This assessment will also be facilitated through a tutorial given in the practical slot in Week 8.

On successful completion you will be able to:

- Define evolution and distinguish micro- and macroevolution, and natural and sexual selection
- Identify and contrast different concepts of species
- Apply scientific techniques, including microscopy, measurement, and observation, to [collect data and] answer questions in evolutionary biology
- Analyse collected data using [simple] statistics and present it graphically
- Evaluate the different approaches to studying evolution, including [using] the fossil record, experimental biology, field biology, and genomics

## Practical Participation

Due: **By week 13**

Weighting: **0%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

You will be expected to actively participate in 6 out of 9 class practicals throughout the session.

On successful completion you will be able to:

- Demonstrate foundational learning skills including active engagement in the learning process

## Final Exam

Due: **Exam Period**

Weighting: **40%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

The final exam, to be held during the exam period at the end of the session, will test your understanding of the evolutionary concepts and examples that have been taught across the course. The final exam will test content from the lectures and practicals, but will particularly focus on the content given in the Weekly Engagement Material.

On successful completion you will be able to:

- Demonstrate foundational learning skills including active engagement in the learning process

## Delivery and Resources

### Required reading

**Evolution: Making sense of Life (second edition), Carl Zimmer & Douglas J. Emlen (2016), Roberts and Company Publishers Inc, Greenwood Village, Colorado, US. ISBN 978-1-936221-55-4**

This text-book is required reading for the course and complements the material covered in lectures and practical classes. Students will be examined on material that may be covered only in the lectures, the text-book, or the practical component.

### Required unit materials

For practical classes we recommend that you use an A4 ring-binder with lined paper for taking notes and blank paper for diagrams.

You will also need **a lab coat and enclosed shoes** for every practical class in accordance with standard laboratory safety procedures. **Without either of these you will not be allowed entry to the laboratory.**

Lecture graphics and recordings will be available on iLearn (<http://ilearn.mq.edu.au>).

iLearn is a web-based communication package and can be accessed by most web browsers from inside or outside the University. *iLearn and email will be the primary methods of*



*communication in this subject.*

You are expected to use iLearn for:

- Regularly checking subject announcements
- Downloading lecture, laboratory and reference materials
- Completing review questions
- Submitting assignments
- Checking your grades

*How do you log in?* The URL for iLearn log in page is: <http://ilearn.mq.edu.au/>.

You must log in each time you use it. Your user name is your student number, and your password is your myMQ student portal password, provided upon enrolment (unless you've changed it). If you are having trouble accessing your online unit due to a disability or health condition, please go to the Student Services Website for information on how to get assistance. If you are having problems logging on, that is, if you cannot log in after ensuring you have entered your username and password correctly, you should contact Student IT Help, Phone: (02) 9850 4357.

## Unit Schedule

There will be a double lecture each week at 4pm on Monday in the Lecture theatre on the ground floor of 14 Sir Christopher Ondaatje Ave. Room - Theatre 100. This is the building formally known as E7B. Lectures have been scheduled for the same day as the practical in an effort to make it easier for you to attend the lectures. Lecture attendance is strongly encouraged as it will help in your understanding and ongoing learning (which will be tested regularly through iLearn-based quizzes).

Each week there will be practical classes held in the teaching labs in F7B (4 Wallys Walk) Science labs 105, 107, 110. These labs will be held across two sessions, either 9-12 or 13-16, and weekly attendance is compulsory for internal students.

External students will complete these practicals during special on campus sessions on 24th April and 26th and 27th April.

## 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](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://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](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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](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)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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/](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:

#### Assessment tasks

- Practical Reports
- News article evaluation
- Research project plan

### 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

- Apply scientific techniques, including microscopy, measurement, and observation, to [collect data and] answer questions in evolutionary biology
- Demonstrate foundational learning skills including active engagement in the learning process

#### Assessment tasks

- Weekly reading material

- Online Quizzes
- News article evaluation
- Practical Participation
- Final Exam

## 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

- Define evolution and distinguish micro- and macroevolution, and natural and sexual selection
- Identify and contrast different concepts of species
- Interpret cladograms to infer evolutionary relationships among organisms
- Apply scientific techniques, including microscopy, measurement, and observation, to [collect data and] answer questions in evolutionary biology
- Analyse collected data using [simple] statistics and present it graphically
- Evaluate the different approaches to studying evolution, including [using] the fossil record, experimental biology, field biology, and genomics

### Assessment tasks

- Weekly reading material
- Online Quizzes
- Practical Reports
- News article evaluation
- Research project plan
- Practical Participation
- Final Exam

## 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

- Define evolution and distinguish micro- and macroevolution, and natural and sexual selection
- Identify and contrast different concepts of species
- Interpret cladograms to infer evolutionary relationships among organisms
- Apply scientific techniques, including microscopy, measurement, and observation, to [collect data and] answer questions in evolutionary biology
- Analyse collected data using [simple] statistics and present it graphically
- Evaluate the different approaches to studying evolution, including [using] the fossil record, experimental biology, field biology, and genomics
- Argue the importance of evolution in addressing contemporary global issues, with support from the scientific literature

### Assessment tasks

- Weekly reading material
- Online Quizzes
- Practical Reports
- News article evaluation
- Research project plan
- Final Exam

## 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

- Identify and contrast different concepts of species
- Interpret cladograms to infer evolutionary relationships among organisms
- Apply scientific techniques, including microscopy, measurement, and observation, to [collect data and] answer questions in evolutionary biology

- Analyse collected data using [simple] statistics and present it graphically
- Evaluate the different approaches to studying evolution, including [using] the fossil record, experimental biology, field biology, and genomics

## Assessment tasks

- Weekly reading material
- Online Quizzes
- Practical Reports
- News article evaluation
- Research project plan
- Practical Participation

## 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

- Define evolution and distinguish micro- and macroevolution, and natural and sexual selection
- Identify and contrast different concepts of species
- Apply scientific techniques, including microscopy, measurement, and observation, to [collect data and] answer questions in evolutionary biology
- Analyse collected data using [simple] statistics and present it graphically
- Evaluate the different approaches to studying evolution, including [using] the fossil record, experimental biology, field biology, and genomics
- Argue the importance of evolution in addressing contemporary global issues, with support from the scientific literature

## Assessment tasks

- Weekly reading material
- Online Quizzes
- Practical Reports
- News article evaluation
- Research project plan

## 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 outcome

- Demonstrate foundational learning skills including active engagement in the learning process

### Assessment task

- News article evaluation

## 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

- Apply scientific techniques, including microscopy, measurement, and observation, to [collect data and] answer questions in evolutionary biology
- Argue the importance of evolution in addressing contemporary global issues, with support from the scientific literature

### Assessment task

- News article evaluation

## Changes from Previous Offering

In 2019 we have brought back the final examination because whilst the weekly engagement task was popular and improved regular engagement with the material, it was very difficult to assess objectively. The final exam will help to better evaluate student understanding of the subject matter delivered in the course. We have also introduced a hurdle of attendance at six out of nine practical classes, which reflects the importance of these classes in generating a good understanding and practical grasp of the subject material.