



# BIOL114

## Evolution and Biodiversity

S1 External 2015

*Dept of Biological Sciences*

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Principle tutor

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Contact via Email

Monday, Tuesday, Wednesday and via ilearn all days

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Credit points

3

Prerequisites

Corequisites

Co-badged status

Unit description

This unit introduces students to the essential concepts in current biology. The unit forms the first step for students pursuing a career in the biological sciences, and provides a basis for students in other disciplines who wish to maintain an interest in this dynamic field. The theme of this unit is evolution. The first part of the unit is concerned with the origin of life and discusses current theories on how life may have arisen on a previously lifeless planet. We discuss evolutionary theory in detail including some of the genetic principles that underlie evolution. In the second part we introduce the major groups of organisms examining their diversity and how they function. In the final part we discuss the ecological interactions between organisms from the small scale to global patterns. Throughout the unit, these core concepts are illustrated with examples from current research. This unit is designed as a companion unit to BIOL115.

## 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:

1. Define the processes of evolution and apply its concepts

2. Describe the major morphological characteristics of the main groups of organisms and compare and contrast their biology
3. Develop falsifiable hypotheses and design experiments to test them
4. Test a hypothesis by collecting and analysing appropriate data
5. Effectively communicate biology using written and oral media
6. Locate and critically assess scientific literature
7. Use digital microscopy technology to successfully visualise biological specimens

## Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Weekly activities</u>	5%	No	Weekly
<u>Skill tests</u>	2%	No	5 during semester
<u>Mini-oral presentation</u>	3%	No	Week 5
<u>Mid-semester test</u>	15%	No	Week 6
<u>Scientific Journal Article</u>	25%	No	Week 8
<u>Final Exam</u>	50%	No	After Week 13

### Weekly activities

Due: **Weekly**

Weighting: **5%**

The Weekly Activities are accessible through iLearn and are designed to keep you up to date with the unit material and prepare you for assessments and practical's. Both 'lecture quizzes' and 'problems and tasks' open at 12pm Monday and close 12pm the following Monday. They will be found under their own heading of weekly activities in each weekly session.

**Note the Weekly activities have two components:**

Component 1:

*Lecture quizzes:* Multiple-choice quizzes based on content (2.5% calculated from the number of correct answers). For the majority of quizzes you will be given the option of two attempts. If you do the quiz twice your mark will be the average of both attempts.

Component 2:

*Problems and tasks:* a variety of activities to prepare you for practical's and major assignments (2.5% calculated from the number of tasks completed).

You must complete both components each week.

On successful completion you will be able to:

- 1. Define the processes of evolution and apply its concepts
- 2. Describe the major morphological characteristics of the main groups of organisms and compare and contrast their biology
- 3. Develop falsifiable hypotheses and design experiments to test them
- 5. Effectively communicate biology using written and oral media
- 6. Locate and critically assess scientific literature

## Skill tests

Due: **5 during semester**

Weighting: **2%**

Employers want to know students have a proficiency in a range of practical skills. Every second practical there will be a short skills test. They will range from how to search for scientific articles, how to set-up a microscope, how to apply the scientific method, how to plot data in excel, to how to interpret phylogenies. All skills tests will be based on skills that you have learnt in earlier practical's. You will have a time limit to complete the task. During that time you can attempt the task as many times as you like until the tutor agrees the task has been completed satisfactorily. The mark will be on a pass/fail basis. For some items if you fail you will be excluded from using the apparatus until you show competency. Please take note of when these are happening – forgetting they were on will not work as a defence.

On successful completion you will be able to:

- 4. Test a hypothesis by collecting and analysing appropriate data
- 6. Locate and critically assess scientific literature
- 7. Use digital microscopy technology to successfully visualise biological specimens

## Mini-oral presentation

Due: **Week 5**

Weighting: **3%**

As a group of four students will present a scientific article from PLoS One to a small audience. This exercise is designed to help you develop your communication skills and for you to critically assess how figures are presented in the scientific literature. Your tutor will assess the groups performance and you will receive written feedback on your presentation style. Presentations will occur during practical 5.

On successful completion you will be able to:

- 5. Effectively communicate biology using written and oral media
- 6. Locate and critically assess scientific literature

## Mid-semester test

Due: **Week 6**

Weighting: **15%**

The mid-semester test will consist of multiple choice and short answer questions cover all lecture material up to and including Lecture 11. The test will be conducted under exam conditions, that is, silently and with no communication between students. No written material, programmable calculators, mobile phones or electronic tablets may be brought into the exam room.

On successful completion you will be able to:

- 1. Define the processes of evolution and apply its concepts
- 2. Describe the major morphological characteristics of the main groups of organisms and compare and contrast their biology

## Scientific Journal Article

Due: **Week 8**

Weighting: **25%**

This challenging task is designed to develop your scientific writing style, and your numerical and graphing skills. During Practicals 2-4 you will collect data to statistically analyse and graphically present in this article. To write your scientific article you will have to locate, comprehend, discuss and cite scientific literature (and *only* scientific literature). You also have to submit your *Scientific Journal Article* to Turnitin (instructions below). By the time this article is due you should be familiar with how to write each of the sections of a research paper, be apply to source original peer-reviewed articles and be familiar with adhering to formatting criteria for any given journal. For the purposes of this exercise you will be asked to submit to an in-house journal only available to Biol114 subscribers known as the Journal of Seedy Research.

On successful completion you will be able to:

- 3. Develop falsifiable hypotheses and design experiments to test them
- 4. Test a hypothesis by collecting and analysing appropriate data
- 5. Effectively communicate biology using written and oral media
- 6. Locate and critically assess scientific literature
- 7. Use digital microscopy technology to successfully visualise biological specimens

## Final Exam

Due: **After Week 13**

Weighting: **50%**

The final exam is a three-hour exam with a mixture of multiple choice and short answer questions. The exam will cover *all* Lecture and Practical material presented in the unit. Exam conditions will be as for mid-semester test: silently and with no communication between

students. No written material, programmable calculators or mobile phones may be brought into the exam room. Paper language translating dictionaries will be allowed. Notify the convener if this required. **The University will announce the examination date towards the end of semester. We will relay that date via an announcement in Lectures and via iLearn.**

On successful completion you will be able to:

- 1. Define the processes of evolution and apply its concepts
- 2. Describe the major morphological characteristics of the main groups of organisms and compare and contrast their biology
- 3. Develop falsifiable hypotheses and design experiments to test them

## Delivery and Resources

### UNIT COMPLETION REQUIREMENTS

Minimum requirements include:

1. The completion and submission of all assessment tasks (taking into account special considerations)
2. Must achieve a final mark of >50% for your assessment
3. Must achieve a final mark of >50% for your exam
4. Practicals are compulsory.
5. If a practical is missed through illness or mishap you must submit a special consideration via [ask.mq.edu.au](mailto:ask.mq.edu.au). You will need to provide a medical certificate for illness, for other situations you must provide a supporting letter explaining the circumstances that has led to you missing the practicals.
6. Students that miss more than 20% of the practicals without submission of special consideration are unable to pass the unit.

### Overall grades

The current university grading is: fail (F <50%), pass (P 50%-64%), credit (CR 65%-74%), distinction (D 75%-84%) and high distinction (HD 85%-100%).

### Assignment submission, Turnitin and Plagiarism

This is a paperless unit so no paper submissions will be required. You will be required to submit the scientific journal article through iLearn via a Turnitin link. Turnitin is an online program that detects plagiarised pieces of work. It compares not only work between students in the current year but also across previous years, across institutions and with all published materials. It is an incredibly effective tool. So do yourself a favour and write your work in your own words – in fact it is a requirement for all assignments in the course that they be written in your own words. Do not under any circumstances lend your work to another student. If that student plagiarises your work you too will be liable. Do not copy and paste text into your document with the thought you will modify it later – you will forget! Lastly do not leave things to the last moment, as that is when the

urge to plagiarise hits you most.

**The penalties imposed by the University for plagiarism are serious and may include expulsion from the University. ANY evidence of plagiarism WILL be dealt with according to University policy.**

Plagiarism involves using the work of another person and presenting it as one's own. A full outline of the Universities policy on plagiarism is found at [http://www.mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://www.mq.edu.au/policy/docs/academic_honesty/policy.html). The website includes a general discussion of plagiarism, definitions, examples drawn from concrete cases, procedures that will be followed by the University in cases of plagiarism, and recommended penalties. Students are expected to familiarise themselves with the website.

### **Extensions and penalties**

10% will be deducted for each day an assignment is late. If you are unable to submit the assignment by the due date then an extension must be sought *before the due date* unless this is absolutely impossible. To support your extension you may be asked to submit a special consideration. **All applications for extensions of deadlines must be submitted to the subject convener.**

### **What to do if you miss an assignment task or practical session**

Through:

#### **Illness or misfortune**

- **Submit special consideration via [ask.mq.edu.au](http://ask.mq.edu.au) (Do not give doctors certificates to tutors)**
  - You will need to provide documentation for illness. For other situations you must provide a supporting letter explaining the circumstances that has led to you missing the practicals.
- **Inform tutor that you have submitted consideration and ensure the role is marked accordingly**
- **The course convener will process your special consideration. If approved it is your responsibility to arrange with the tutor/practical convener to do assignment or practical at another time.**
- **If you are sick on the day of your practical but are fine the next day and there are practicals on you may attend these practicals to catch up. You must however ensure your usual tutor is aware of this and that the role has been marked appropriately. This is your responsibility.**

#### **Neglect (i.e. forgot or just slack)**

- **Be honest!**
- **Contact the practical convener to plead your case.**

## RESOURCES and SUPPORT

### How to find the answers

1. **Read the unit outline**
2. **Consult ilearn (often the majority of questions have already been asked)**
3. **If the answer to a question will benefit the many please post it on ilearn. The appropriate person will answer it in time.**
4. **Lab technician: only during practical classes and only technical questions**
5. **Tutor: questions throughout practical sessions and specific queries about assignments**
6. **Practical convener: the majority of other enquiries including practical class allocations, mark queries and organising alternative times for assessments or extensions.**
7. **Course convener: lecture content, withdrawal, personal issues**
8. **Unexpected adjustments made during the course will announced via announcements so make sure you check ilearn regularly.**

### iLearn

The primary means of communication for this unit is via iLearn™ and email (see above for staff email addresses). iLearn is a web-based computer mediated communication package and can be accessed by most web browsers from inside or outside the University.

We expect you to use iLearn for:

- Doing the Weekly Activities and Quizzes
- Regularly checking subject announcements (at least twice per week)
- Discussing the unit and its content with staff and other students
- Downloading Lecture and Practical materials
- Downloading reference materials

### *Logging in to iLearn*

The URL for the iLearn login page is: <https://ilearn.mq.edu.au/>

You will need to log in to iLearn each time you use it. Your user name is your student number. If you are having trouble accessing your online unit due to a disability or health condition, please visit the Student Services Website [students.mq.edu.au/campus\\_life/wellbeing](https://students.mq.edu.au/campus_life/wellbeing) for information on how to get assistance. If you are having problems logging on after ensuring you have entered your username and password correctly, you should contact Student IT Help, [informatics.mq.edu.au/help](https://informatics.mq.edu.au/help).

### EMAIL PROTOCOL

1. Always put the subject in the subject line i.e. BIOL114 – if you do not do this you risk the



email not being noticed

2. Be courteous i.e. address the intended reader appropriately and say thank you! Your demonstrators get paid for the time in class and marking so if they answer a question they are doing it in their own time.

#### TEXTBOOK - *Principles of Biology*, Nature Education

**This textbook is compulsory** and will be used for both Biol114 and Biol115. It is accessed at <http://www.nature.com/principles> where you select student and search for Biol114/115. The textbook should appear and the purchasing price. There are a number of advantages of this text: it is paper free, much cheaper to buy, has interactive quizzes and has real scientific literature associated with each chapter. We anticipate this will provide a significant contribution to your learning. Please feel free to provide feedback on this textbook as we progress through the course.

Please note: this is an e-textbook there is no hard copy of the text available.

Registration for *Principles of Biology*:

#### **What you will need:**

- Access Code from the Bookstore or a Credit Card to purchase from the site
- Course Code from your Instructor

#### **Registration Steps:**

- Please visit: [www.nature.com/principles](http://www.nature.com/principles)
- Under “Getting Started” (on the bottom right), click on “Students”
- Input the Course Code of: **"code available through ilearn"** into the “Search by your course code” box
- Review the course details (instructor, institution, course) and if it is correct, click on “Yes, take me to this class”
- If you are planning on using a credit card, click on “Purchase.” You will need to “Register” first which creates a username and password to access the site.
- If you have an access code from the bookstore, click on “Redeem access code.” You will also have to register, but this will be after inputting your access code.

#### **Once you have registered, here is how you can access your course/text:**

- Please visit: [www.nature.com/principles](http://www.nature.com/principles)
- On the upper right navigation, click on “Sign In”
- Input your username and password credentials
- Click on “MyBookshelf”
- Click the link for your text to enter your classroom.

Enjoy!

## WRITING AIDS

Pechenik's guide to writing about biology is also recommended for this course as well as the following website.

<http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWsections.html>.

This website is comprehensive and will be incredibly useful throughout the semester.

## 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)

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

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

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

Grievance Management Policy [http://mq.edu.au/policy/docs/grievance\\_management/policy.html](http://mq.edu.au/policy/docs/grievance_management/policy.html)

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

## 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://informatics.mq.edu.au/help/>.

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

## Graduate Capabilities

### 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

- 1. Define the processes of evolution and apply its concepts
- 3. Develop falsifiable hypotheses and design experiments to test them
- 4. Test a hypothesis by collecting and analysing appropriate data
- 5. Effectively communicate biology using written and oral media
- 6. Locate and critically assess scientific literature

### Assessment tasks

- Weekly activities
- Mini-oral presentation

## 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**

- 1. Define the processes of evolution and apply its concepts
- 3. Develop falsifiable hypotheses and design experiments to test them
- 4. Test a hypothesis by collecting and analysing appropriate data
- 5. Effectively communicate biology using written and oral media
- 6. Locate and critically assess scientific literature

## **Assessment tasks**

- Skill tests
- Scientific Journal Article
- Final Exam

## **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**

- 1. Define the processes of evolution and apply its concepts
- 3. Develop falsifiable hypotheses and design experiments to test them
- 5. Effectively communicate biology using written and oral media
- 6. Locate and critically assess scientific literature

## **Assessment task**

- Weekly activities

## **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**

- 1. Define the processes of evolution and apply its concepts
- 2. Describe the major morphological characteristics of the main groups of organisms and compare and contrast their biology
- 3. Develop falsifiable hypotheses and design experiments to test them
- 4. Test a hypothesis by collecting and analysing appropriate data
- 7. Use digital microscopy technology to successfully visualise biological specimens

## **Assessment tasks**

- Weekly activities
- Skill tests
- Mid-semester test
- Scientific Journal Article
- 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**

- 1. Define the processes of evolution and apply its concepts
- 3. Develop falsifiable hypotheses and design experiments to test them
- 4. Test a hypothesis by collecting and analysing appropriate data
- 5. Effectively communicate biology using written and oral media
- 6. Locate and critically assess scientific literature
- 7. Use digital microscopy technology to successfully visualise biological specimens

## **Assessment tasks**

- Weekly activities
- Mid-semester test
- Scientific Journal Article
- 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

- 1. Define the processes of evolution and apply its concepts
- 3. Develop falsifiable hypotheses and design experiments to test them
- 4. Test a hypothesis by collecting and analysing appropriate data
- 5. Effectively communicate biology using written and oral media
- 6. Locate and critically assess scientific literature
- 7. Use digital microscopy technology to successfully visualise biological specimens

### Assessment tasks

- Weekly activities
- Skill tests
- Mini-oral presentation
- Mid-semester test
- Scientific Journal Article
- Final Exam

## 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

- 1. Define the processes of evolution and apply its concepts
- 3. Develop falsifiable hypotheses and design experiments to test them
- 5. Effectively communicate biology using written and oral media
- 6. Locate and critically assess scientific literature

## Assessment tasks

- Weekly activities
- Mini-oral presentation
- Mid-semester test
- Scientific Journal Article

## 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

- 1. Define the processes of evolution and apply its concepts
- 3. Develop falsifiable hypotheses and design experiments to test them
- 4. Test a hypothesis by collecting and analysing appropriate data
- 5. Effectively communicate biology using written and oral media
- 6. Locate and critically assess scientific literature

## Assessment tasks

- Mini-oral presentation
- Scientific Journal Article

## 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

- 1. Define the processes of evolution and apply its concepts
- 2. Describe the major morphological characteristics of the main groups of organisms and compare and contrast their biology
- 3. Develop falsifiable hypotheses and design experiments to test them
- 4. Test a hypothesis by collecting and analysing appropriate data

- 5. Effectively communicate biology using written and oral media
- 6. Locate and critically assess scientific literature

## **Assessment tasks**

- Mini-oral presentation
- Scientific Journal Article