



BIOL605

Organismal Biology

S1 External 2018

Dept of Biological Sciences

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General Information

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Credit points

4

Prerequisites

Admission to MBiotech or MConsBiol or GradDipConsBiol or GradCertConsBiol or MSc

Corequisites

Co-badged status

BIOL228

Unit description

This unit explores the biological diversity of plants and animals. Relationships between structure and function are emphasised. The unit also discusses how organisms have adapted to specific environments. There is a heavy emphasis on evolutionary processes and how these have generated biological diversity. A comparative approach is taken, with adaptation discussed in the context of evolutionary trees and the fossil record. The unit is suitable for students interested in organismal biology, science education, and research.

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. Interpret phylogenetic trees and describe evolutionary relationships amongst groups of organisms
2. Give examples of individual organisms that belong to the major animal and plant groups
3. Identify the key anatomical traits used to define major groups
4. Explain how these traits are linked to the success of different organisms in solving problems posed by diverse environments
5. Analyse experimental findings and present them in the format of a scientific report
6. Critically evaluate information from the scientific literature

Assessment Tasks

Name	Weighting	Hurdle	Due
Weekly Assessment	25%	No	each week
Literature Analysis	20%	No	13/4/18
Practical Report	20%	No	08/06/18
Final Examination	35%	No	exam period

Weekly Assessment

Due: **each week**

Weighting: **25%**

20 question quizzes regarding the content of the lectures, textbook, and practicals

On successful completion you will be able to:

- 1. Interpret phylogenetic trees and describe evolutionary relationships amongst groups of organisms
- 2. Give examples of individual organisms that belong to the major animal and plant groups
- 3. Identify the key anatomical traits used to define major groups
- 4. Explain how these traits are linked to the success of different organisms in solving problems posed by diverse environments

Literature Analysis

Due: **13/4/18**

Weighting: **20%**

1500 word written assignment based on provided scientific papers

On successful completion you will be able to:

- 1. Interpret phylogenetic trees and describe evolutionary relationships amongst groups of organisms
- 4. Explain how these traits are linked to the success of different organisms in solving problems posed by diverse environments
- 6. Critically evaluate information from the scientific literature

Practical Report

Due: **08/06/18**

Weighting: **20%**

1000 word practical report based on analysis of data collected in Practical 9

On successful completion you will be able to:

- 5. Analyse experimental findings and present them in the format of a scientific report

Final Examination

Due: **exam period**

Weighting: **35%**

Examination based on the contents of the lectures, textbook, and practicals

On successful completion you will be able to:

- 1. Interpret phylogenetic trees and describe evolutionary relationships amongst groups of

organisms

- 2. Give examples of individual organisms that belong to the major animal and plant groups
- 3. Identify the key anatomical traits used to define major groups
- 4. Explain how these traits are linked to the success of different organisms in solving problems posed by diverse environments

Delivery and Resources

Introduction

Welcome to BIOL228 Organismal Biology, a 3 CP unit that explores the diversity of life on Earth. This unit will probe the form and function, classification, and phylogeny of key plant and animal groups.

Prerequisites for this unit are 12 cp at 100 level or above including BIOL114 and BIOL116.

Unit Description

This unit explores the biological diversity of plants and animals. Relationships between structure and function are emphasised. The unit also discusses how organisms have adapted to specific environments. There is a strong emphasis on evolutionary processes and how these have generated biological diversity. A comparative approach is taken, with adaptation discussed in the context of evolutionary trees and the fossil record. The unit is suitable for students interested in organismal biology, science education, and research.

Unit Delivery and Attendance Requirements

Workload: Since BIOL228 is a 3 cp unit, you are expected to spend about 9 hours per week (including face-to-face teaching time) working on this unit for the duration of the semester. Please note that Macquarie University defines a semester as being 15 weeks in duration: 13 weeks of face-to-face teaching plus the two week mid-semester break.

Lectures: There will be two one hour lectures each week. The first will be held every Monday at 12:00 in 23 Wallys Walk T2. The second will be held every Tuesday at 9:00 AM in the same room. They will be recorded live and posted on Echo360 (accessed via the BIOL228 iLearn site). The weekly quizzes will include material from the lectures. Because many of the questions are based on material only presented in the lectures, if you do not attend or view the lectures you may receive poor grades on the quizzes.

See the Unit Schedule for the topics to be covered each week. For the following reasons, it is in your best interests to attend every one of the lectures:

- Lectures are easier to understand if you can see the instructor.
- Attending lectures gives you an opportunity to ask questions.
- You need to prepare every week anyway because of the quizzes, and you might as well not put it off.

- Students who attend lectures regularly tend to perform better than those students who attend lectures infrequently.
- Lecturers very much appreciate interacting with you personally.

Weekly practical laboratory sessions:

Each internal student is expected to attend one 3 hour prac session during each of nine weeks. Sessions will be held in E8A 120 or E8A 160 and will run from 10:00 AM to 1:00 PM or 2:00 PM to 5:00 PM. You must attend at least six pracs to pass the unit. Each external student is expected to attend the two on campus sessions, which cover nine pracs. The first is on 17 and 18 March and the second is on 18, 19, and 20 April. Sessions will be held in E8A 120 and will run from 9:00 AM to 5:00 PM. You must attend at least six of the nine pracs to pass the unit.

iLearn: PDFs and recordings of the lectures will be available on iLearn (<https://ilearn.mq.edu.au>), which is the primary method of communication for this unit. The site is also used for making announcements, answering questions, and uploading assignments via Turnitin links.

Materials: It is recommended that you maintain a notebook to document your work during the practical sessions. A dissecting kit is not required.

Occupational health and safety: Due to OH&S regulations, all students must wear fully enclosed footwear (i.e. no thongs) at all times during practical laboratory sessions. Students without proper footwear will not be allowed to enter the lab. Food and drink may not be consumed in the lab at any time either.

Recommended Reading

The textbook is entitled Organismal Biology, and it has been specially compiled from three sources for use in this unit. Chapter 1 is an introduction to systematics with an emphasis on phylogenetics, and it comes from Raven et al. (2017). Chapters 2 through 10 are on plants and come mostly from Bidlack and Jansky (2014) with one chapter on eukaryotes from Hickman et al. (2015). Chapters 11 through 19 are on invertebrates and come from Hickman et al. Chapter 20 through 25 are on vertebrates and are also from Hickman et al.

It is recommended that you purchase and regularly consult the textbook. The lectures cover the same topics, so the textbook complements them well. Consulting the textbook will help you to prepare for the weekly quizzes that constitute a major part of your grade.

Unit Schedule

Lecture Schedule

	Date	Lecture
1	26 February	Introduction
2	27 February	The History of Life
3	5 March	Biodiversity and Extinction
4	6 March	Microbes

	Date	Lecture
5	12 March	Plant Evolution
6	13 March	Cyanobacteria and Algae
7	19 March	Mosses and Liverworts
8	20 March	Ferns
9	26 March	Gymnosperms
10	27 March	The Australian Flora
11	3 April	Flowering Plants
12	9 April	Plant Diversity
13	10 April	Porifera and Cnidaria
14	30 April	Minor Protostomes
15	1 May	Lophophorates and Molluscs
16	7 May	Marine Arthropods
17	8 May	Terrestrial Arthropods
18	14 May	Minor Deuterostomes
19	15 May	Fishes
20	21 May	Amphibians
21	22 May	Reptiles I
22	28 May	Reptiles II
23	29 May	Mammals
24	4 June	Human Evolution
25	5 June	Summary

Practical Schedule

	Week	Topic
1	2	The History of Life
2	3	Lower Plants
3	4	Seed Plants
4	5	Leaf Morphology
5	6	Invertebrate Body Plans

	Week	Topic
6	8	Arthropod Diversity
7	9	Butterflies
8	10	Vertebrate Body Plans
9	11	Skull Allometry

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

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

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

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 [eStudent](#). For more information visit 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) 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 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

- 5. Analyse experimental findings and present them in the format of a scientific report
- 6. Critically evaluate information from the scientific literature

Assessment tasks

- Literature Analysis
- Practical 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

- 5. Analyse experimental findings and present them in the format of a scientific report
- 6. Critically evaluate information from the scientific literature

Assessment tasks

- Literature Analysis
- Practical Report

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. Interpret phylogenetic trees and describe evolutionary relationships amongst groups of organisms
- 4. Explain how these traits are linked to the success of different organisms in solving problems posed by diverse environments
- 5. Analyse experimental findings and present them in the format of a scientific report
- 6. Critically evaluate information from the scientific literature

Assessment tasks

- Weekly Assessment
- Literature Analysis
- Practical Report
- Final Examination

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. Interpret phylogenetic trees and describe evolutionary relationships amongst groups of organisms
- 2. Give examples of individual organisms that belong to the major animal and plant groups
- 3. Identify the key anatomical traits used to define major groups
- 4. Explain how these traits are linked to the success of different organisms in solving problems posed by diverse environments
- 5. Analyse experimental findings and present them in the format of a scientific report
- 6. Critically evaluate information from the scientific literature

Assessment tasks

- Weekly Assessment
- Literature Analysis
- Practical Report
- Final Examination

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. Interpret phylogenetic trees and describe evolutionary relationships amongst groups of organisms
- 3. Identify the key anatomical traits used to define major groups

- 4. Explain how these traits are linked to the success of different organisms in solving problems posed by diverse environments
- 5. Analyse experimental findings and present them in the format of a scientific report
- 6. Critically evaluate information from the scientific literature

Assessment tasks

- Weekly Assessment
- Literature Analysis
- Practical Report
- Final Examination

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. Interpret phylogenetic trees and describe evolutionary relationships amongst groups of organisms
- 2. Give examples of individual organisms that belong to the major animal and plant groups
- 3. Identify the key anatomical traits used to define major groups
- 4. Explain how these traits are linked to the success of different organisms in solving problems posed by diverse environments
- 5. Analyse experimental findings and present them in the format of a scientific report
- 6. Critically evaluate information from the scientific literature

Assessment tasks

- Weekly Assessment
- Literature Analysis
- Practical Report
- Final Examination

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

- 5. Analyse experimental findings and present them in the format of a scientific report
- 6. Critically evaluate information from the scientific literature

Assessment tasks

- Literature Analysis
- Practical Report