



# BIOL2310

## Diversity of Life

Session 2, In person-scheduled-weekday, North Ryde 2023

*School of Natural Sciences*

### Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	2
<u>General Assessment Information</u>	3
<u>Assessment Tasks</u>	6
<u>Delivery and Resources</u>	9
<u>Unit Schedule</u>	11
<u>Policies and Procedures</u>	12

#### Disclaimer

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## General Information

Unit convenor and teaching staff

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Lecturer

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Credit points

10

Prerequisites

50cp at 1000 level or above including (BIOL1310 or BIOL114)

Corequisites

Co-badged status

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.

## 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:

**ULO1:** Interpret phylogenetic trees and describe evolutionary relationships amongst groups of organisms

**ULO2:** Give examples of individual organisms that belong to the major animal and plant groups

**ULO3:** Identify the key anatomical traits used to define major groups

**ULO4:** Explain how key anatomical traits are linked to the success of different organisms in solving problems posed by diverse environments

**ULO5:** Critically evaluate the primary scientific literature

## General Assessment Information

### Requirements to Pass this Unit

To pass this unit you must:

- o Achieve a total mark equal to or greater than 50%

### Late Assessment Submission Penalty

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark of the task) will be applied for each day a written report or presentation assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. The submission time for all uploaded assessments is **11:55 pm**. A 1-hour grace period will be provided to students who experience a technical concern. For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, please apply for Special Consideration.

### Assessments where Late Submissions will be accepted

- o Phylogenetic Illustration – YES, Standard Late Penalty applies
- o Literature Review – YES, Standard Late Penalty applies
- o Practical Report – YES, Standard Late Penalty applies

### Special Consideration

The Special Consideration Policy aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable and significantly disruptive, and which may affect their performance in assessment.

*Written Assessments:* If you experience circumstances or events that affect your ability to complete the written assessments in this unit on time, please inform the convenor and submit a Special Consideration request through [ask.mq.edu.au](https://ask.mq.edu.au).

*Weekly practice-based tasks:* To pass the unit you need to demonstrate ongoing development of skills and application of knowledge in 6 out of 9 of the weekly practical classes. If you miss a weekly practical class due to a serious, unavoidable and significant disruption, contact your convenor ASAP as you may be able to attend another class that week. If it is not possible to attend another class, you should still contact your convenor for access to class material to review in your own time.

Note that a Special Consideration should **only be applied for** if you miss more than three of the weekly practical classes.

### Weekly Assessment (25%)

Your progress will be tracked on a weekly basis by means of a 20-question online quiz. Content from the discussions and pracs will be covered. To accommodate infrequent attendance students, quizzes will only reference material in the practicals during the second half of the term (after the break). Because the unit is rich on information, if you do not study on a regular basis your grades will be impacted.

The slides for each discussion in this unit are based on primary scientific literature. You will be expected to learn fundamental concepts in organismal biology such as the intellectual basis of phylogenetics and taxonomy, the causes and consequences of adaptive radiations and mass extinctions, and the functional roles of anatomical structures. You will also learn a considerable amount of specific detail concerning the names, relationships, evolutionary histories, and key anatomical adaptations of major taxonomic groups.

Practical work constitutes a large proportion of the unit, and the weekly three-hour prac sessions are intended to lead on from the group discussion where possible (although some pracs relate to material covered the next week). Students are expected to attend every single prac, and you must attend at least six pracs to pass the unit.

Note that there are no pracs for *weekday* students during weeks 1, 7, 12, and 13.

### **Phylogenetic Illustration (5%)**

The Phylogenetic Illustration involves preparing a slideshow document that depicts the relationships of the species in one family of plants, invertebrates, or vertebrates (a family is a group of genera, and a genus is a group of species). You must select one family from one of several lists that will be provided. The document should be prepared in PowerPoint, Keynote, or another presentation application, but submitted in PDF format. The presentation should start with a title slide; a slide giving the full scientific reference for the phylogeny; a slide with a sentence identifying and explaining a physical characteristic unique to the family (a synapomorphy); and an illustration of the phylogeny itself. Following this, there should be at least 15 slides each showing a photo of a species, its scientific name, its English name or country or origin, and a URL linking to the source of the image. At least 10 different websites should be used to provide the images.

A Turnitin link for the assignment will be made available on iLearn early during the semester. Copies may not be submitted directly to the staff. An announcement will be made once the detailed instructions have been released, including the list of families that can be chosen.

Marks will be allotted for the title and reference slides, presentation and selection of the phylogeny, explanation of the synapomorphy, species images and names or countries of origin, and URLs. Points will be deducted if the main source is not a primary scientific research paper, meaning that literature reviews and websites per se cannot be used to obtain a phylogeny.

There will be a standard per-day penalties for handing the assignment in late.

### **Literature Review (20%)**

The Literature Review will provide an opportunity to read and evaluate recently published scientific papers. You will track down the papers based on information provided in the detailed instructions to be released on the iLearn site. Once identified, you will summarise the papers. To

do this, you will sort out which statements out of a provided list are accurate. You will assign each true statement to a particular paper. You will also expand on the basic phylogenetic information included in the statements. Finally, you will discuss the strengths and weaknesses of the papers in a short and succinct manner. This task will allow you to become familiar with the primary way scientists communicate their ideas.

As with all the assignments, a Turnitin link for the assignment will be made available on iLearn. Hard copies may not be submitted.

Each paper summary should be preceded by a full reference to the paper, giving all the authors, the publication year, paper title, journal title, volume number, and page or article numbers. The structure of each abstract should follow the guidelines used by *Nature* magazine, which can be viewed on the iLearn site. The only differences are that you must refer to "the authors" and "they" instead of "we". Also, be sure to include numerical figures, such as counts of evaluated species and characters, in the abstract itself.

After the abstracts and elaborations of phylogenetic details, you will present a brief analysis comparing and contrasting the papers. You should identify common themes, explain conflicts, and weigh the pros and cons of the different data sets, methods, results, and interpretations. This section should not heavily repeat information already given. Finally, you will conclude with a statement of your own view of the facts and provide directions for future research.

The abstracts and everything else in the assignment must be entirely in your own words. Any copied words, no matter how few, must be placed in quotation marks. If you copy anything without attribution or without using quotation marks you will not receive credit for the relevant parts of the assignment. If you have copied without attribution, then depending on the severity of the case you may be reported to the Faculty Student Administration Manager, in accord with the Academic Honesty Procedure (see the *Policies and procedures* section).

It is very important to understand that text generated by artificial intelligence, such as ChatGPT, does not qualify as being "in your own words". If you use any text of this kind you will be penalised as explained above. The assignment will be designed in such a way that it would be tedious in the first place to have AI generate the text.

This is not group work. You must not consult with other students in any way about the intellectual content of this assignment. Doing so would be a bad idea anyway because the other students may have reached incorrect conclusions. If you have any questions about what to do, ask the convenor instead.

You may want to consult the short, simple volume by W. Strunk and E.B. White called *The Elements of Style*.

Marks will be allotted for quality of the abstracts, scientific evaluation, adherence to the overall 1500 word limit, presentation, and references. The exact weighting of these elements will be stated in the detailed instructions that will be released on the iLearn site. Use 12 point font and double space the text and use the Harvard Referencing Style (so numbering of references in the text and use of footnotes is not allowed). Again, you must present your own arguments in your own words and they must be grounded in the references.

As with the other assignments, there will be a standard per-day penalty for late submission.

## Practical Report (20%)

The 1000 word Practical Report will be based on data collected during the Skull Allometry exercise during Week 11 (weekday attendees) or the second On Campus Session (infrequent attendees). The report will be due at the end of Week 13.

The report will be in the format of a real-world scientific research journal article, except that references are not required. As with the Literature Review, further details will be announced via iLearn during the semester and a Turnitin link will be provided (no hard copies).

The report will focus on two issues: how shape changes with size (allometry), and how body mass can be predicted by skull measurements. Importantly, the Report will include data on additional species not measured in the Skull Allometry practical. These data will be extracted by you from primary literature sources, and the text will discuss how well the equations developed in the prac predicted the body mass of the newly included species.

Marks will be allotted for scientific evaluation (50%), adherence to the word limit (10%), and presentation (30%), as discussed in the preceding section. The assignment must also include a graph on the last page showing a scatter plot with a fitted regression line, accompanied by an accurate and informative caption (10%).

The scientific evaluation marks will consider whether you included enough details regarding data collection and data analysis procedures to allow replicating your analysis. The presentation marks will additionally assess the use of proper, standardised subheadings (Introduction, Data, Methods, Results, Discussion, and References if they are included). An abstract should not be included.

The same lateness penalties discussed in the preceding section apply to this assignment.

## Final Exam (30%)

The highly challenging Final Exam will cover all the major concepts introduced in the unit. It will include some combination of multiple choice questions, short answer questions, and long answer questions. Details will be given during the semester.

Importantly, the Final Exam will focus on material explained in the discussions. This material is drawn from primary scientific literature, so studying the Discussion recordings and PDFs is essential. A study guide will be provided to help with preparation, and the last Discussion of the semester will give detailed guidance about major topics to be addressed in the Final Exam.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Weekly Assessment</u>	25%	No	Weekly
<u>Phylogenetic Illustration</u>	5%	No	11/08/23

Name	Weighting	Hurdle	Due
Literature Review	20%	No	08/09/23
Practical Report	20%	No	03/11/23
Final Examination	30%	No	Exam period

## Weekly Assessment

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 24 hours

Due: **Weekly**

Weighting: **25%**

Undertake a weekly quiz

On successful completion you will be able to:

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

## Phylogenetic Illustration

Assessment Type <sup>1</sup>: Media presentation

Indicative Time on Task <sup>2</sup>: 5 hours

Due: **11/08/23**

Weighting: **5%**

Develop a slide show including a phylogeny and images of species

On successful completion you will be able to:

- Interpret phylogenetic trees and describe evolutionary relationships amongst groups of organisms
- Give examples of individual organisms that belong to the major animal and plant groups

- Critically evaluate the primary scientific literature

## Literature Review

Assessment Type <sup>1</sup>: Essay

Indicative Time on Task <sup>2</sup>: 19 hours

Due: **08/09/23**

Weighting: **20%**

Present a summary and synthesis of multiple scientific papers

On successful completion you will be able to:

- Interpret phylogenetic trees and describe evolutionary relationships amongst groups of organisms
- Give examples of individual organisms that belong to the major animal and plant groups
- Identify the key anatomical traits used to define major groups
- Explain how key anatomical traits are linked to the success of different organisms in solving problems posed by diverse environments
- Critically evaluate the primary scientific literature

## Practical Report

Assessment Type <sup>1</sup>: Lab report

Indicative Time on Task <sup>2</sup>: 19 hours

Due: **03/11/23**

Weighting: **20%**

Write a report on one of the practical exercises

On successful completion you will be able to:

- Give examples of individual organisms that belong to the major animal and plant groups

## Final Examination

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 30 hours

Due: **Exam period**

Weighting: **30%**



A final invigilated exam will be held during the formal examination period

On successful completion you will be able to:

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

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<sup>1</sup> If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

<sup>2</sup> Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

## Delivery and Resources

### Week 1 classes

There will be two one-hour discussions of the pre-recorded lectures during Week 1. They will be held at the usual scheduled times for lectures in the unit: Monday at 11:00 AM and Tuesday at 11:00 AM. All discussions are in 23 Wallys Walk, T2 Theatre. There are no other activities scheduled for Week 1, but pracs start during Week 2.

### Methods of Communication

We will communicate with you via your university email and through announcements on iLearn. Queries to convenors can either be placed on the iLearn discussion board or sent to the unit convenor via the contact email on iLearn. The convenor prefers direct email contact.

### COVID Information

For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie website: <https://www.mq.edu.au/about/coronavirus-faqs>. Remember to check this page regularly in case the information and requirements change during semester. If there are any changes to this unit in relation to COVID, these will be communicated via iLearn.

### Changes to the unit from last offering

We value student feedback to be able to continually improve the way we offer our units. As such we encourage students to provide constructive feedback via student surveys, to the teaching staff directly, or via the FSE Student Experience & Feedback link in the iLearn page.

Student feedback from the previous offering of this unit was very positive overall, with students pleased with the clarity around assessment requirements and the level of support from teaching staff. As such, no change to the delivery of the unit is planned, however we will continue to strive to improve the level of support and the level of student engagement.

### **Workload**

There are nine pracs, two Discussions every week, and a quiz related to the Discussions and pracs every week, including Week 13. Therefore, you are expected to work on this unit every single week for the duration of the semester.

### **Lectures and discussions**

There will be two one-hour, in-person discussions of the pre-recorded lectures and other learning materials each week. They will focus on the PDFs to be found on the iLearn site. Although they will be recorded live and posted on Echo360 (accessed via the BIOL2310 iLearn site), you will probably not be able to hear the other students clearly from the recordings. Therefore, all students taking any offering of this unit are strongly advised to attend the discussions.

The weekly quizzes will focus on the same PDF material, in addition to material learned in the pracs. In other words, many of the questions are based on material only presented and explained in the lectures and discussions. Therefore, if you do not attend or view them you may receive poor grades on the quizzes.

See the iLearn page for the topics to be covered each week. For the following reasons, it is in your best interests to attend:

- Conversations are easier to understand if you can see the instructor.
- Attending 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 discussions regularly tend to perform better than those students who attend them infrequently.
- Instructors very much appreciate interacting with you personally.

### **Practical laboratory sessions**

Each *weekday* student is expected to attend one three-hour prac session during each of nine weeks. Sessions will be held in 5 Wallys Walk – 428 Glasshouse, and they will run on Wednesday and Thursday mornings and afternoons starting respectively at 10:00 AM and 2:00 PM. You must attend at least six pracs to pass the unit.

Each *infrequent attendance* student is expected to attend the two on-campus sessions, which cover the same nine pracs. The first is on 19 and 20 August (a Saturday and Sunday) and will be in 14 Eastern Road – 120 Science Lab. The second is on 11, 12, and 13 September (a Monday,

Tuesday, and Wednesday) and will also be in 120 Science Lab. Sessions will run from 9:00 AM to 5:00 PM, except on the last day of the second session, which will run until noon. You must attend at least six of the nine pracs to pass the unit.

### **iLearn**

PDFs and recordings of the lectures and discussions 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 or bring a laptop 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 – so 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 material presented here is more current, detailed, and directly tied to primary scientific literature than what you would find in any undergraduate textbook. Therefore, you do not need to purchase one. Instead, you are encouraged to consult primary literature referenced in the PDFs that accompany the lectures and discussions.

## **Unit Schedule**

Lectures and discussions will be on Mondays and Tuesdays from 11:00 AM to noon, and will be held in 23 Wallys Walk, T2 Theatre. Lectures will be pre-recorded and released on the iLearn site. There will be detailed group discussions of the lecture slides and other topics during the in-person lecture slots. Please view the lectures ahead of time.

Topics of the discussions and complete PDFs of the slides will be placed on the iLearn page in the appropriate weekly sections. The discussions will start with introductions to unit and to phylogenetics during Week 1. The history of life on Earth and biodiversity and extinction will be covered during Week 2. Week 3 will introduce biogeography and microbes. Plants will be covered in seven discussions running through the first part of Week 7. Invertebrates will be covered during the second discussion of Week 7 and the following five discussions through the first one of Week 10. The next six discussions are on vertebrates, and the final one during Week 13 is a unit summary intended to help students prepare for the final.

Practicals for weekly attendees will be delivered during weeks 2, 3, 4, 5, 6, 8, 9, 10, and 11, so there will be no pracs during weeks 1, 7, 12, and 13. Topics for the pracs are given on the iLearn page in the weekly sections. Pracs for infrequent attendees will be held in August and

September, as detailed in the Delivery and Resources section.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>). 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](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

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

To find other policies relating to Teaching and Learning, visit [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>) and use the [search tool](#).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/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](https://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

### The Writing Centre

[The Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

## Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

## 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.