BIOL6310

Diversity of Life

Session 1, Infrequent attendance, North Ryde 2020

Department of Biological Sciences

Contents

General Information

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Credit points
10

Prerequisites
Admission to MBiotech or MConsBiol or GradDipConsBiol or GradCertConsBiol or MSc or MScInnovationBioConsMgmt

Corequisites
Co-badged status BIOL2310
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:

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: Present phylogenetic information in the format of slide show

ULO6: Critically evaluate the primary scientific literature

Assessment Tasks

Coronavirus (COVID-19) Update

Assessment details are no longer provided here as a result of changes due to the Coronavirus (COVID-19) pandemic.

Students should consult iLearn for revised unit information.

Find out more about the Coronavirus (COVID-19) and potential impacts on staff and students

General Assessment Information

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 externals, quizzes will only reference material in the practicals after the first on campus session. 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 such as phyla, classes, and orders.

Practical work constitutes a large proportion of the unit, and the weekly prac sessions are intended to lead on from the group discussions (although some pracs relate to material covered the next week). All prac sessions will be up to 3 hours in duration. The prac sessions for *internals* will held in E8A 120 on Tuesdays and Wednesdays. The prac sessions for *externals* will be held in E8A 120 in March and April. Students are expected to attend every single prac, and you must attend at least six pracs to pass the unit. If you attend fewer, you will automatically be failed.

Note that there are no internal pracs during weeks 1, 7, 12, and 13.

Phylogenetic Illustration (5%)

Creating your own Phylogenetic Illustration will help you to become more familiar with interpreting phylogenies (= evolutionary trees), which are presented many times in the Discussion PDFs and must be understood to profit from this unit. An Illustration consists of a slide show prepared in PowerPoint and saved as a PDF (do not submit the original PowerPoint file!). It includes a phylogeny taken from the literature and at least 15 images drawn from at least 10 websites that illustrate the species included in the phylogeny. The phylogeny must pertain to a taxonomic group (usually a particular family) that comes from a list provide to you in the detailed instructions.

A Turnitin link for the assignment will be made available on iLearn early during the semester. Hard copies may not be submitted. An announcement will be made once the detailed instructions have been released.

Marks will be allotted for accuracy of the title and reference slides (10%); correct and clear presentation of the phylogeny (10%); choice of a phylogeny relevant to the instructions that includes at least 15 particular species (10%); quality and relevance of the species images (60%); and accuracy, formatting, and relevance of the 10 or more distinct URLs (10%).

Literature Review (20%)

The 1500 word Literature Review will provide an opportunity to read and evaluate recently published scientific papers that will be assigned to you. You will have to first summarise them and then discuss their strengths and weaknesses in a short and succinct manner. This task will

allow you to become familiar with the primary way scientists communicate their ideas.

The Turnitin link will be made available several weeks before the assignment is due, and finalised instructions will be placed on the iLearn site. Microsoft Word versions are required: PDFs and hard copies may not be submitted.

The assignment will begin by presenting a 225 to 275 word abstract of each paper. Each abstract 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 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 stick to the 225 to 275 word limit and you must refer to "the authors" and "they" instead of "we".

After the abstracts you will present a 500 word analysis of all the papers together, identifying common themes, explaining conflicts, and weighing the pros and cons of the different data sets, methods, results, and interpretations. Finally, you will conclude with a statement of your own view of the facts and provide directions for future research. Brief subheadings should be provided throughout the assignment.

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 Integrity Policy (see the *Policies and Procedures* section).

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 the following:

• Quality of the abstracts (20%): Organisation and coherence of the text, and factual correctness. You must use your own words.

• Scientific evaluation (30%): Organisation of the text, lack of repetition, persuasive answering of questions posed in the instructions, and presentation of a soundly argued personal opinion. You must present your own arguments in your own words and they must be grounded in the references.

• Adherence to the overall 1500 word limit (10%): Marks will be deducted for going either under or over the limit by 10%.

• Presentation (30%): Spelling, grammar, conciseness, and sensible use of subheadings. Use 12 point font and double space the text.

• References (10%): Matching of citations to the text and the formatting and completeness of the references. You must use the Harvard Referencing Style. Numbering of references in the text and use of footnotes is not allowed.

Practical Report (15%)

The 1000 word Practical Report will be based on data collected during the Skull Allometry

exercise during Week 11 (internals) or the second On Campus Session (externals). The report will be due at the end of Week 13. It will be in the format of a real-world scientific research journal article, except that references are not required.

As with the other assessments, further details will be announced via iLearn during the semester and a Turnitin link will be provided. Again, provide the document in MS Word format, not as a PDF or in a hard copy.

Marks will be allotted for scientific evaluation (50%), adherence to the word limit (10%), and presentation (30%), as discussed in the preceding section. 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, References). An abstract should not be included.

The assignment must also include a graph showing a scatter plot with a fitted regression line, accompanied by an accurate and informative caption (10%).

Final Examination (35%)

The Final Examination will cover all the major concepts introduced in the unit. It will include multiple choice questions, short answer questions, and essays. Details will be given in the unit's final discussion. Please consult the official Macquarie website for details on receiving special consideration for the final in order to sit a supplementary exam.

Plagiarism

Assessments submitted via Turnitin will be subjected to plagiarism detection. Plagiarism will not be tolerated and may result in disciplinary action.

Late submissions

Assessments submitted after the due date and without an approved Special Consideration will be penalised by 10% of the mark per day late. For example, if the assessment carries a value of 10% of the total unit grade and you initially achieve a score of 90% but have submitted one day late, 9 marks will be subtracted from the initial score because 90% times 10% equals 9.

Delivery and Resources

Coronavirus (COVID-19) Update

Any references to on-campus delivery below may no longer be relevant due to COVID-19.

Please check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

Introduction

Welcome to BIOL6310 Diversity of Life, a 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.

The prerequisite for this unit is BIOL1310 (Organisms to Ecosystems).

Unit description

This unit explores the biological diversity of plants and animals. There is a strong emphasis on evolutionary relationships, the fossil record, and key anatomical structures. The unit is suitable for students interested in organismal biology, science education, and research.

Unit delivery and attendance requirements

Workload

Since BIOL6310 is a regular 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.

Discussions

There will be two one-hour Discussions of the learning materials each week. They will be structured as combined lectures and tutorials, and will focus on the PDFs to be found on the iLearn site. Each week, the first Discussion will be held on Monday at 12:00 in 14 SCO T2 Theatre. The second will be held immediately afterwards at 1:00 PM in the same room. The Discussions will be recorded live and posted on Echo360 (accessed via the BIOL6310 iLearn site). External students are invited to attend the Discussions in person if they wish.

The weekly quizzes will focus on the same PDF material. In other words, many of the questions are based on material only presented and explained in the Discussions. Therefore, if you do not attend or view them 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:

• Conversations are easier to understand if you can see the instructor.

• Attending gives you an opportunity to ask questions and engage in discussion.

• 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 students who attend them infrequently.

• Lecturers very much appreciate interacting with you personally.

Weekly practical laboratory sessions

Each *internal* student is expected to attend one three-hour prac session during each of nine weeks. Sessions will be held in 4 Wallys Walk – 110 Science Lab, and they will run from 10:00 AM to 1:00 PM and from 2:00 PM to 5:00 PM on Tuesday and Wednesday. 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 the same nine pracs. The first is on 21 and 22 March (a Saturday and Sunday) and will be in 14 Eastern

Road – 120 Science Lab. The second is on 14, 15, and 16 April (a Tuesday, Wednesday, and Thursday) and will also be in 14 Eastern Road – 120 Science Lab. Sessions will run from 9:00 AM to 5:00 PM. Externals also must attend at least six of the nine pracs to pass the unit.

iLearn

PDFs and recordings of the 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 (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 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 Discussions.

Unit Schedule

Coronavirus (COVID-19) Update

The unit schedule/topics and any references to on-campus delivery below may no longer be relevant due to COVID-19. Please consult iLearn for latest details, and check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

Discussions		
1	24 February	Introduction
2	24 February	The History of Life
3	2 March	Evolution of Ecosystems
4	2 March	Biodiversity and Extinction
5	9 March	Microbes
6	9 March	Land Plants
7	16 March	Flowering Plants
8	16 March	Major Plant Families

9	23 March	Plant Diversity
10	23 March	Evolution of the Australian Flora
11	30 March	Plant Reproductive Ecology
12	30 March	Plant Diversification and Speciation
13	6 April	Plant Traits and Ecological Strategies
14	6 April	Porifera and Cnidaria
	RECESS	
15	27 April	Minor Protostomes
16	27 April	Lophophorates and Molluscs
17	4 May	Marine Arthropods
18	4 May	Terrestrial Arthropods
19	11 May	Minor Deuterostomes
20	11 May	Fishes
21	18 May	Primitive Tetrapods
22	18 May	Reptiles Part 1
23	25 May	Reptiles Part 2
24	25 May	Mammals
25	1 June	Human Evolution
26	1 June	Summary
Internal pracs		
1	3 and 4 March	The History of Life
2	10 and 11 March	Leaf Morphology
3	17 and 18 March	Plant Floral Allometry
4	24 and 25 March	Bioinformatics and Conservation
5	31 March and 1 April	Invertebrate Body Plans
6	28 and 29 April	Arthropod Diversity
7	5 and 6 May	Butterflies
8	12 and 13 May	Birds
9	19 and 20 May	Skull Allometry
External pracs		

1	21 March	The History of Life
2	21 March	Leaf Morphology
3	22 March	Plant Floral Allometry
4	22 March	Bioinformatics and Conservation
5	14 April	Invertebrate Body Plans
6	14 April	Arthropod Diversity
7	15 April	Butterflies
8	15 April	Birds
9	16 April	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). 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.)*

Students seeking more policy resources can visit the 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).

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 or if you are a Global MBA student contact 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) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- Getting help with your assignment
- Workshops
- StudyWise
- 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

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

If you are a Global MBA student contact 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/.

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.

Changes since First Published

Date	Description
14/02/2020	Information on plagiarism and late submissions has been added, and an error in the discussion schedule has been fixed.