



BIOL208

Animal Structure and Function

S1 External 2016

Dept of Biological Sciences

Contents

| | |
|--------------------------------|----|
| <u>General Information</u> | 2 |
| <u>Learning Outcomes</u> | 2 |
| <u>Assessment Tasks</u> | 3 |
| <u>Delivery and Resources</u> | 5 |
| <u>Unit Schedule</u> | 11 |
| <u>Policies and Procedures</u> | 11 |
| <u>Graduate Capabilities</u> | 13 |

Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff

Unit Convenor

Martin Whiting

martin.whiting@mq.edu.au

by appointment

Katherine McClellan

katherine.mcclellan@mq.edu.au

Caitlin Kordis

caitlin.kordis@mq.edu.au

Credit points

3

Prerequisites

12cp(P) including (BIOL114(P) and 3cp(P) in BIOL units at 100 level) or admission to GCertBiotech

Corequisites

Co-badged status

Unit description

This unit explores the biological diversity in form and function across the major groups of animals. Relationships between structure and function are emphasised using a comparative approach to understand how different animal groups carry out similar life processes. This unit also discusses how structural characteristics and their corresponding function have adapted to specific environments, with particular focus on adaptations that enabled life on land for various taxa. During the practical component of this unit you will gain an intimate appreciation of the diversity in animal morphology, physiology, behaviour and function. This unit is suitable for students interested in whole animal biology or science education, or for students interested in further research or research careers in biological or biomedical fields.

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:

Identify and use correct biological nomenclature

Assign animals to the major taxonomic classifications

Identify the anatomical traits diagnostic to the major animal groupings

link these anatomical traits to the success of different animals in solving problems posed by diverse environments

Prepare experimental findings in the format of a scientific publication

Read and critically appraise papers from the scientific literature

Assessment Tasks

| Name | Weighting | Hurdle | Due |
|-----------------------------------|-----------|--------|---------------|
| Assignment 1 | 10% | No | 18/03/2016 |
| Mid-semester exam | 20% | No | 18 April |
| Quizzes | 10% | No | Every 4 weeks |
| Assignment 2 | 20% | No | 25/05/2016 |
| Final exam | 40% | No | TBA |

Assignment 1

Due: **18/03/2016**

Weighting: **10%**

You are required to write a popular science article suitable for publication in a natural history magazine. We will provide papers from the primary scientific literature, plus popular science examples, and your goal will be to interpret and report one of these studies and its findings for a popular audience. Further details for this assignment will be provided in class and online. It is the mandatory EARLY ASSESSMENT TASK, due at the start of week 4. The scheduling of this assessment is designed so that you will have some time once the marks are published for this assignment to withdraw without penalty, should you choose to.

On successful completion you will be able to:

- Identify and use correct biological nomenclature
- Read and critically appraise papers from the scientific literature

Mid-semester exam

Due: **18 April**

Weighting: **20%**

You will be tested on your knowledge of lecture material for weeks 1-10. This will be a 50 min test during the lecture period for internal students, and at the beginning of the second residential session for external students. The test will be conducted under exam conditions, that is, silently and with no written material, calculators or mobile phones.

On successful completion you will be able to:

- Identify and use correct biological nomenclature
- Assign animals to the major taxonomic classifications
- Identify the anatomical traits diagnostic to the major animal groupings
- link these anatomical traits to the success of different animals in solving problems posed by diverse environments
- Read and critically appraise papers from the scientific literature

Quizzes

Due: **Every 4 weeks**

Weighting: **10%**

You will have an online quiz every 4 weeks based on the lecture material. Each quiz will count 2.5%.

On successful completion you will be able to:

- Identify and use correct biological nomenclature
- Assign animals to the major taxonomic classifications
- Identify the anatomical traits diagnostic to the major animal groupings
- link these anatomical traits to the success of different animals in solving problems posed by diverse environments
- Read and critically appraise papers from the scientific literature

Assignment 2

Due: **25/05/2016**

Weighting: **20%**

You will be required to collect and analyse data (during a lab class) and subsequently prepare a manuscript in the format of a real-world scientific research journal. As with

Assignment 1, further details will be provided in class and online. Data collection and analysis will take place during practical classes. The assignment is submitted via TURNITIN (no hard copies).

On successful completion you will be able to:

- Identify and use correct biological nomenclature
- Assign animals to the major taxonomic classifications
- Identify the anatomical traits diagnostic to the major animal groupings
- link these anatomical traits to the success of different animals in solving problems posed by diverse environments
- Prepare experimental findings in the format of a scientific publication
- Read and critically appraise papers from the scientific literature

Final exam

Due: **TBA**

Weighting: **40%**

You will be tested on your knowledge of course content, including information from lectures and practical classes up to and including week 13, plus prescribed reading from your textbook (Hickman *et al.*) and other sources. The assessment will consist of short- and long-answer essay-style questions. The exam will take place during the formal end-of-year exam period.

On successful completion you will be able to:

- Identify and use correct biological nomenclature
- Assign animals to the major taxonomic classifications
- Identify the anatomical traits diagnostic to the major animal groupings
- link these anatomical traits to the success of different animals in solving problems posed by diverse environments
- Read and critically appraise papers from the scientific literature

Delivery and Resources

To pass (P) this unit, students must achieve a standardized numerical grade (SNG) of at least 50, and make a genuine effort at completing all assessment tasks. The final decision regarding what constitutes a 'genuine effort' will be taken by the unit convener.

Concessional passes (formerly known as PC grades) were phased out as of **2011**. You also

MUST ATTEND PRACS. If you miss more than one prac you will not be able to complete the unit. We take attendance at pracs.

Unit schedule

| Timetable: | | | |
|-----------------------------------|---|---------------|-------------|
| Lecture 1 | Mon | 13:00 – 14:00 | E7B-T2 |
| Lecture 2 | Thurs | 12:00 – 13:00 | E7B-T2 |
| Residential session 1 | Sat 12 th – Sun 13 th Mar 09:00 – 16:00 | | E8A-120-160 |
| Residential session 2 | Mon 18 th – Wed 20 th Apr 09:00 – 16:00 | | E8A-120-160 |
| Census date for Session 1: 26 Mar | Last date to withdraw from a unit without financial or academic penalty | | |

Online unit delivery

Lecture graphics and iLectures will be available on iLearn (<https://ilearn.mq.edu.au>). iLearn™ is a web-based communication package and can be accessed by most web browsers from inside or outside the University. **iLearn and email are the primary methods of communication in this subject.** Use iLearn for:

- Regularly checking subject announcements and communications;
- Downloading lecture, laboratory and reference materials;
- Uploading Assignments to TURNITIN via iLearn links;
- Checking your grades.

How do I log in? The URL for the login page is: <https://ilearn.mq.edu.au/>.

You must log in to iLearn each time you use it. Your user name is your student number, and your password is your myMQ student portal password, provided upon enrolment (unless you've changed it). If you are having trouble accessing your online unit due to a disability or health condition, please go to the Student Enquiry Services website at <http://www.student.mq.edu.au/services/> for information on how to get assistance.

If you are having problems logging on, that is, if you cannot log in after ensuring you have entered your username and password correctly, you can also contact Student IT Help, Phone: (02) 9850 4357 (in Sydney) or 1 800 674 357 (outside Sydney).

Provisional lecture outline

This schedule may change slightly throughout the semester. Monday and Thursday lectures are in **E7B-T2** (internals) and online.

| Week | Lecture | DATE | TOPIC |
|------|---------|--------|---|
| 1 | 1 | Feb 29 | Introduction/Course overview |
| | 2 | Mar 3 | Evolution and the origin of life |
| 2 | 3 | Mar 7 | Evolution and the origin of life: linking structure and function. Case study: <i>Anolis</i> lizards |
| | 4 | Mar 10 | Porifera Multicellularity |
| | 5 | Mar 14 | Cnidaria Tissues |
| 3 | 6 | Mar 17 | Platyhelminthes Mesoderm, Organ systems, bilateral asymmetry |
| | 7 | Mar 21 | Nematodes Body cavity, Pseudocoelom |
| | 8 | Mar 24 | Annelida Coelom and Segmentation |
| 4 | 9 | Mar 28 | Mollusca Coelom |
| | 10 | Mar 31 | Deuterostoma Echinodermata & Chordata |

| | | | |
|----------------------------|----|--------|--|
| 6 | 11 | Apr 4 | Immune function and defence – Special guest lecture from Prof David Raftos |
| | 12 | Apr 7 | Mid-semester exam |
| Lecture recess 11-24 April | | | |
| 7 | 13 | Apr 25 | Arthropoda [1] Tagmosis, exoskeletons, jointed appendages |
| | 14 | Apr 28 | Arthropoda [2] Insects rule the world |
| 8 | 15 | May 2 | Respiration – Dr. Darrell Kemp |
| | 16 | May 5 | Circulation |
| 9 | 17 | May 9 | Osmoregulation and Excretion – Dr. Darrell Kemp |
| | 18 | May 12 | Feeding and Digestion |
| 10 | 19 | May 16 | Coordination [1] Nerves and muscles |
| | 20 | May 19 | Coordination [2] Endocrine system |
| 11 | 21 | May 23 | Reproduction |
| | 22 | May 26 | Reproduction |

| | | | |
|----|----|--------|-------------------------------------|
| 12 | 23 | May 30 | Vertebrate Innovations |
| | 24 | Jun 2 | Behaviour |
| 13 | 25 | Jun 6 | Behaviour |
| | 26 | Jun 9 | Course overview and exam discussion |

Practical sessions

External students (**All held in E8A-120/150/160, ground floor, Biology building E8A**)

| Lab# | DATES | ACTIVITY |
|-----------------------|-------------------------------|---|
| Residential session I | | |
| 1 & 2 | Mar 12 AM PM | Introduction & Sponges/ Tissue systems – Platyhelminthes/Cnidaria |
| 3 & 4 | Mar 13 AM PM | Worms! Acoelomate, pseudo-coelomate & coelomate body cavities – Platyhelminthes, Nematodes & Annelids Mollusc dissection |

| Residential session II | | |
|------------------------|-----------|--|
| -- | 9:00 AM | Mid-semester exam |
| 5 | Apr 18 AM | Invertebrate body size and colouration (Assignment 2) |
| 6 | PM | The wonderful world of Arthropod diversity |
| 7 | Apr 19 AM | Insect dissection |
| 8 | PM | Deuterostome lineage - Echinoderms to Chordates |
| 9 | Apr 20 AM | Life Aquatic/Vertebrate skulls and dentition |

Required and Recommended Texts and/or Materials

Required unit materials

The recommended textbook for this unit is:

Hickman CP, Roberts LS, Keen SL, Larson A, l'Anson H & Eisenhour DJ - *Integrated Principles of Zoology*. 17th Edition. McGraw-Hill. ISBN: 9780073524214.

Copies of this text are available in the University bookstore.

The work carried out during practical classes is an integral part of the course. You will be required to maintain a comprehensive lab notebook which documents all of the work and discussion during the practical sessions. Thus, all notes, records, illustrations and results should be entered into your practical book during class. We suggest a blank (unlined notebook) because you will mostly use it for drawings. Alternatively, you can use a book that alternates between blank and lined pages. Your work in this lab book is checked before you leave the prac and this is when your attendance is recorded.

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

- a pair of fine pointed scissors
- a large pair of fine pointed forceps
- one pair of fine (watchmaker's) forceps

The U@MQ Shop sells dissecting kits for around \$25 (if you are going to buy one, make sure it includes fine pointed scissors forceps). It's a good idea to own your own dissection kit because you can use them for other courses and during your own pursuits as a biologist. Also, because the refurbished biology teaching labs have full digital capture capabilities for the two microscopes at each workstation, you will be able to save images and screenshots of your work. Please **remember to bring a USB flash drive** as you won't be able to keep images on the workstation computer's hard drive.

Recommended readings

The following texts are also available in the library:

- Biology of Animals by Hickman *et al.* (McGraw-Hill)
- Biology of the Invertebrates by Pechenik (McGraw-Hill)
- An Introduction to the Invertebrates by Moore (Cambridge)
- Invertebrate Zoology by Barnes (Saunders College Publishing)
- Vertebrate Life by Pough *et al.* (Prentice Hall)
- Animal Physiology by Eckert (Freeman)

Unit Schedule

Please refer to iLearn for full Lecture and Practical schedule.

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

New Assessment Policy in effect from Session 2 2016 http://mq.edu.au/policy/docs/assessment/policy_2016.html. For more information visit http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

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

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy 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/

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.

Assignment submission

All assignments must be handed in according to the Faculty of Science procedures. Students should submit their assignments online via TURNITIN. As we are attempting to make this a paperless unit as much as possible, hard copies are not required.

Assignment submission via TURNITIN

TURNITIN is a powerful online tool for detecting plagiarism. It compares the text of a submitted document (i.e., your assignments) with the work of all current classmates, past students, as well as published material in books, journals and on the web. As part of our commitment to academic honesty at Macquarie, you are required to submit your assignments to TURNITIN in this unit. You will be able to submit to TURNITIN via the moodle links in iLearn (links for doing this are embedded in the content for the weeks when each task is due). Refer to “Academic Honesty” (below) for more information regarding plagiarism policy and penalties.

Extensions, penalties and special consideration

Late assignments will attract a penalty at the rate of **5 %** of the total mark allocated for the assignment **per day** past the due date. The deadlines for assignments are **not negotiable**. You will only escape penalties if you can produce a valid medical certificate or a letter with appropriate supporting documents outlining serious extenuating circumstances. All applications for special consideration or extension must be sought *before the due date* unless this is impossible, and from the co-conveners, Martin Whiting. Please note that an Assignment will be considered late if both the required hardcopy (or emailed copy for external students) **AND** the TURNITIN submission are not received prior to the advertised due date/time.

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

- link these anatomical traits to the success of different animals in solving problems posed by diverse environments
- Prepare experimental findings in the format of a scientific publication
- Read and critically appraise papers from the scientific literature

Assessment tasks

- Assignment 1

- Mid-semester exam
- Quizzes
- Assignment 2
- Final exam

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

- Identify and use correct biological nomenclature
- Prepare experimental findings in the format of a scientific publication
- Read and critically appraise papers from the scientific literature

Assessment tasks

- Assignment 1
- Mid-semester exam
- Quizzes
- Assignment 2
- 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

- Identify and use correct biological nomenclature
- Assign animals to the major taxonomic classifications
- Identify the anatomical traits diagnostic to the major animal groupings
- link these anatomical traits to the success of different animals in solving problems posed by diverse environments

- Prepare experimental findings in the format of a scientific publication
- Read and critically appraise papers from the scientific literature

Assessment tasks

- Assignment 1
- Mid-semester exam
- Quizzes
- Assignment 2
- Final exam

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Identify and use correct biological nomenclature
- Assign animals to the major taxonomic classifications
- Identify the anatomical traits diagnostic to the major animal groupings
- link these anatomical traits to the success of different animals in solving problems posed by diverse environments
- Prepare experimental findings in the format of a scientific publication
- Read and critically appraise papers from the scientific literature

Assessment tasks

- Assignment 1
- Mid-semester exam
- Quizzes
- Assignment 2
- 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

- link these anatomical traits to the success of different animals in solving problems posed by diverse environments
- Prepare experimental findings in the format of a scientific publication
- Read and critically appraise papers from the scientific literature

Assessment tasks

- Assignment 1
- Mid-semester exam
- Quizzes
- Assignment 2
- 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

- link these anatomical traits to the success of different animals in solving problems posed by diverse environments
- Prepare experimental findings in the format of a scientific publication
- Read and critically appraise papers from the scientific literature

Assessment tasks

- Assignment 1
- Mid-semester exam
- Quizzes
- Assignment 2
- 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

- Identify and use correct biological nomenclature
- Prepare experimental findings in the format of a scientific publication
- Read and critically appraise papers from the scientific literature

Assessment tasks

- Assignment 1
- Mid-semester exam
- Quizzes
- Assignment 2
- Final exam

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

- Identify and use correct biological nomenclature
- Assign animals to the major taxonomic classifications
- Identify the anatomical traits diagnostic to the major animal groupings
- link these anatomical traits to the success of different animals in solving problems posed by diverse environments
- Prepare experimental findings in the format of a scientific publication
- Read and critically appraise papers from the scientific literature

Assessment tasks

- Assignment 1
- Mid-semester exam
- Quizzes
- Assignment 2
- Final exam

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

- Identify and use correct biological nomenclature
- Assign animals to the major taxonomic classifications
- Identify the anatomical traits diagnostic to the major animal groupings
- link these anatomical traits to the success of different animals in solving problems posed by diverse environments
- Prepare experimental findings in the format of a scientific publication
- Read and critically appraise papers from the scientific literature

Assessment tasks

- Assignment 1
- Mid-semester exam
- Quizzes
- Assignment 2
- Final exam