



# BIOL3310

## Invertebrate Biology

Session 2, Weekday attendance, North Ryde 2020

*Department of Biological Sciences*

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#### Disclaimer

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#### Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

## General Information

Unit convenor and teaching staff

Ajay Narendra

[ajay.narendra@mq.edu.au](mailto:ajay.narendra@mq.edu.au)

Credit points

10

Prerequisites

130cp at 1000 level or above including (BIOL2510 or BIOL262) or BIOL208 or (BIOL2310 or BIOL228) or (BIOL2210 or BIOL229)

Corequisites

Co-badged status

Unit description

This unit explores the fascinating world of invertebrate animals. The unit starts by briefly outlining the diversity and key features of the major groups of invertebrate animals (excluding unicellular organisms), and using phylogenetic analysis to explore evolutionary relationships. Once this is established, we move away from a development and taxonomic focus to discuss major topics including: mating systems, communication, host-parasite relationships, predator-prey interactions, sociality, biological control, climate change, and conservation. These major topics draw on examples from research papers on various groups of invertebrates. This unit is suitable for students who are interested in whole animal biology or biological education, or for students who are interested in further 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:** Competently use microscopy and imaging techniques to classify invertebrates into major taxonomic groups on the basis of morphological traits

**ULO2:** Identify morphological, behavioural, and physiological adaptations that allow invertebrates to survive in distinct habitats

**ULO3:** Assess how adaptations of invertebrates influence species and community interactions, and ecosystem function

**ULO4:** Create hypotheses and design experiments to test those hypothesis by analysing appropriate data

**ULO5:** Critically evaluate scientific hypotheses by statistically analysing data, and accurately interpreting results of those analyses

**ULO6:** Effectively communicate biological research findings and concepts to diverse audiences including scientists and the general public

## Assessment Tasks

| Name  | Weighting | Hurdle | Due        |
|---|-----------|--------|------------|
| <a href="#"><u>Lecture Participation</u></a>      | 5%        | No     | weekly     |
| <a href="#"><u>Microscopy and Imaging</u></a>     | 20%       | No     | 11/10/2020 |
| <a href="#"><u>Scientific Journal Article</u></a> | 20%       | No     | 25/10/2020 |
| <a href="#"><u>Final exam</u></a>                 | 40%       | No     | TBA        |
| <a href="#"><u>Early assessment quiz</u></a>      | 5%        | No     | 16/08/2020 |
| <a href="#"><u>Mid-Session Test</u></a>           | 10%       | No     | 23/09/2020 |

### Lecture Participation

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

Indicative Time on Task <sup>2</sup>: 6 hours

Due: **weekly**

Weighting: **5%**

After each lecture an associated short quiz will be available on iLearn. Students must respond to all questions on their device (laptop, tablet or phone). Each quiz will remain open **only** for one week following each lecture. Participation for all students requires lectures to be listened to and quizzes answered within one week after the lecture.

On successful completion you will be able to:

- Identify morphological, behavioural, and physiological adaptations that allow invertebrates to survive in distinct habitats
- Assess how adaptations of invertebrates influence species and community interactions, and ecosystem function

## Microscopy and Imaging

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

Indicative Time on Task <sup>2</sup>: 16 hours

Due: **11/10/2020**

Weighting: **20%**

Students will develop skills in imaging and measuring features in specimens from images acquired using light and scanning electron microscopes; build an image portfolio with appropriate descriptions of the features they image. Further details will be provided on iLearn and in the practical classes.

On successful completion you will be able to:

- Competently use microscopy and imaging techniques to classify invertebrates into major taxonomic groups on the basis of morphological traits
- Identify morphological, behavioural, and physiological adaptations that allow invertebrates to survive in distinct habitats
- Effectively communicate biological research findings and concepts to diverse audiences including scientists and the general public

## Scientific Journal Article

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

Indicative Time on Task <sup>2</sup>: 16 hours

Due: **25/10/2020**

Weighting: **20%**

Students will complete a scientific research report, written in their own words. You will develop a hypothesis, design an experiment, analyse data, prepare figures and write a manuscript. The report will follow the format of a Current Biology paper - details of which will be provided in class and online in iLearn.

On successful completion you will be able to:

- Create hypotheses and design experiments to test those hypothesis by analysing appropriate data
- Critically evaluate scientific hypotheses by statistically analysing data, and accurately interpreting results of those analyses

- Effectively communicate biological research findings and concepts to diverse audiences including scientists and the general public

## Final exam

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

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

Due: **TBA**

Weighting: **40%**

A test on knowledge of course content (lectures, pracs and readings) up to and including week 13.

If you receive special consideration for the final exam, a supplementary exam will be scheduled in the interval between the regular exam period and the start of the next session. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

On successful completion you will be able to:

- Competently use microscopy and imaging techniques to classify invertebrates into major taxonomic groups on the basis of morphological traits
- Identify morphological, behavioural, and physiological adaptations that allow invertebrates to survive in distinct habitats
- Assess how adaptations of invertebrates influence species and community interactions, and ecosystem function
- Create hypotheses and design experiments to test those hypothesis by analysing appropriate data

## Early assessment quiz

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

Indicative Time on Task <sup>2</sup>: 6 hours

Due: **16/08/2020**

Weighting: **5%**

This is an early assessment quiz to help you know how you are doing early on in the unit. It will

cover material in the first 3 weeks of semester.

On successful completion you will be able to:

- Identify morphological, behavioural, and physiological adaptations that allow invertebrates to survive in distinct habitats
- Assess how adaptations of invertebrates influence species and community interactions, and ecosystem function

## Mid-Session Test

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

Indicative Time on Task <sup>2</sup>: 8 hours

Due: **23/09/2020**

Weighting: **10%**

A multiple choice answer test on knowledge of course content (both lectures and pracs) for the first half of semester.

On successful completion you will be able to:

- Competently use microscopy and imaging techniques to classify invertebrates into major taxonomic groups on the basis of morphological traits
- Identify morphological, behavioural, and physiological adaptations that allow invertebrates to survive in distinct habitats
- Assess how adaptations of invertebrates influence species and community interactions, and ecosystem function

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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

**Required unit materials**

The unit will be delivered as a semi-block unit. Pre-recorded lectures will be available on Echo360. Practicals will be available to both internals and external students for 4 days (September 21, 22, 23 and 24). In addition, one pre-recorded pracs will be made available.

#### Lectures:

All lectures will be pre-recorded and will be available on Echo360. You will be required to view the complete lecture and then complete an online quiz question/s. Each lecture will have one to three quizzes that can be accessed on iLearn. The quizzes will be kept active for 1 week ONLY after each lecture. You will get a participation mark for a correct answer in the quiz. If there are a multiple quizzes in a lecture, only the correct answers will get a participation mark.

#### Practicals:

Attendance of practicals is compulsory and there is a participation mark for this unit. The work carried out during practical classes is an important and integral part of the course. You must read, download and either print the prac notes to bring to each class, or bring them on a laptop or tablet.

You will also need a practical notebook with unlined pages that you will use to draw organisms, record data and observations. We recommend you use an **A4 sketch pad** for drawing and a lined note pad for note taking and recording data during classes.

You will need enclosed shoes, bring your lab coat for every practical class in accordance with standard laboratory safety procedures. Without which you will not be allowed entry to the laboratory.

#### **Recommended readings**

There are a number of books (also available in the library) that cover various aspects of this unit:

- Richard C. Brusca; Wendy Moore; Stephen M. Shuster (2016) Invertebrates. Sinauer Associates, Inc., Sunderland, Massachusetts U.S.A.
- Ruppert EE, Fox RS & RD Barnes (2004) Invertebrate zoology: a functional evolutionary approach. 7th ed. Sunders College Publishing (3 copies available in Special Reserve)
- Ponder W & D. Lunney (1999) The Other 99%: The Conservation and Biodiversity of Invertebrates. Transactions of the Royal Zoological Society of NSW. Surrey beattie & Sons, Chipping Norton
- Pechenik, J.A. Biology of the invertebrates. 6th ed. Boston, Mass.: McGraw-Hill, 2010.
- Anderson, D.T. (Ed). Invertebrate zoology. 2nd ed. South Melbourne, Vic.: Oxford University Press, 2001
- Moore, J. Introduction to the invertebrates. Cambridge: Cambridge University Press, 2001.
- Romoser, W.S. & Stoffolano, J.G. The science of entomology. 4th ed. Boston, Mass.: WCB McGraw-Hill, 1998.
- Choe, J.C. & Crespi, B.J. (Eds). The evolution of mating systems in insects and

arachnids. Cambridge; New York: Cambridge University Press, 1997.

- Herrera, C.M. & Pellmyr, O. Plant-animal interactions: an evolutionary approach. Oxford: Blackwell Science, 2002.

## UNIT WEBPAGE, TECHNOLOGY USED AND REQUIRED

### Website

iLearn and email will be the principle method of communication in this subject. You will need stable access to the internet to access iLearn: <http://ilearn.mq.edu.au/>. You will need to log in to iLearn each time you use it. Your user name is your student number.

We expect you to use iLearn to:

- Check subject announcements at least weekly
- Access weekly reading and videos
- Download or view lecture materials for revision
- Download laboratory materials
- Download reference materials
- Check your grades

If you are having trouble accessing your online unit due to a disability or health condition, please go to the Student Services Website at [http://students.mq.edu.au/support/health\\_and\\_wellbeing/disability\\_service/](http://students.mq.edu.au/support/health_and_wellbeing/disability_service/) for information on how to get assistance. If you cannot log in after ensuring you have entered your username and password correctly, you should contact Student IT Help, Phone: (02) 9850 4357 (in Sydney) or 1 800 063 191 (outside Sydney).

## Unit Schedule

See iLearn for detailed Schedule of Lectures and Practicals

## 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.*)

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](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://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](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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](http://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](https://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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/](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.