BIOL316

Invertebrate Biology

S2 Day 2019

Dept of Biological Sciences

Contents

General Information 2

Learning Outcomes 2

General Assessment Information 3

Assessment Tasks 4

Delivery and Resources 7

Unit Schedule 8

Policies and Procedures 11

Graduate Capabilities 13

Changes from Previous Offering 17

Changes since First Published 18

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
Ajay Narendra
ajay.narendra@mq.edu.au
Contact via ajay.narendra@mq.edu.au
W19F
by appointment

Kate Barry
kate.barry@mq.edu.au

Credit points
3

Prerequisites
(39cp at 100 level or above) including (BIOL262 or BIOL208 or BIOL228 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:

Competently use light and scanning electron microscopes 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 collecting 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

General Assessment Information

Assessment details

Details of assessments will be provided on iLearn and in class.

Assignment submission

All assignments will be digitally submitted through the appropriate Turnitin submission link on iLearn. No hardcopy / paper submissions are needed. All assessments need to be written in the students own words. For the taxonomic key you will need to submit four drawings. You will need to make a high quality scan of your scientific drawings (e.g. use the library photocopier / scanner and email yourself a copy) then "paste" the digital copy into your assignment before submission.

Academic honesty

All assessments need to be written in the students own words. The penalties imposed by the University for plagiarism are serious and may include expulsion from the University. ANY evidence of plagiarism WILL be dealt with following University policy. Penalties for plagiarism range from a loss of marks to awarding of a zero depending on the level of plagiarism and reporting to Faculty disciplinary committee.

Extensions, penalties and Disruptions to Studies

The deadlines for assignments are not negotiable. If an assignment is submitted late then a penalty of -10% of the mark allocated for the assignment will be deducted per day that the work is late (i.e. 5 days late = -50% of marks available).

If you experience a serious and unavoidable disruption to your studies and require an extension for an assessment please apply for Special Consideration via ask.mq.edu.au with supporting

documentation. If you anticipate a potentially serious and unavoidable disruption (e.g. upcoming surgery) speak to the unit convenor early and apply for an extension before the due date.

Special Consideration for your final examination

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. You can check the supplementary exam information page on FSE101 in iLearn (bit.ly/FSESupp) for dates, and approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination. See the Special Consideration policy here.

Unit completion

To pass this unit, students need to achieve an overall minimum grade of 50%.

Assessment Tasks

Name	Weighting	Hurdle	Due
Lecture Participation	5%	No	Weekly
Early assessment quiz	5%	No	18/8/19
Microscopy	20%	No	Int:11/9/19, Ext:15/9/19
Mid-Session Test	10%	No	Int: 12/9/19, Ext: 25/9/19
Scientific Journal Article	20%	No	30/10/19
Final exam	40%	No	TBA

Lecture Participation

Due: **Weekly**
Weighting: **5%**

During each lecture a couple of questions will be asked and students will need to respond on their smart device (laptop, tablet or phone with ALP app - you need to log into the ALP in iLearn once to activate, if you don't have a device talk to the unit convenor). Participation for **internal** students requires **lecture attendance** and recordings will be muted during activities and activity slide results hidden so that **external** students can participate in a separate **online weekly quiz.**

On successful completion you will be able to:

- Competently use light and scanning electron microscopes 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

Early assessment quiz

Due: **18/8/19**
Weighting: **5%**

This is an early assessment quiz to help you know how you are doing early on in the unit. It will cover lectures 1-6 and will consist of 20 multiple choice answer questions to be completed at home within the 5 day period (9am Wednesday 14 August - midnight Sunday 18th August).

On successful completion you will be able to:

- Competently use light and scanning electron microscopes to classify invertebrates into major taxonomic groups on the basis of morphological traits

Microscopy

Due: **Int:11/9/19, Ext:15/9/19**
Weighting: **20%**

Students will develop skills in imaging and measuring lab specimens using light and scanning electron microscopy techniques; build an image portfolio with appropriate descriptions of the features they image. Further details will be provided on iLearn and in the prac classes.

On successful completion you will be able to:

- Competently use light and scanning electron microscopes 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

Mid-Session Test

Due: **Int: 12/9/19, Ext: 25/9/19**
Weighting: **10%**

A multiple choice answer test on knowledge of course content up to and including week 7. This one hour test will take place in the prac, under closed-book exam conditions during the last prac

before the mid-session break (internals) and during the mid-session break OCS (externals).

On successful completion you will be able to:

- Competently use light and scanning electron microscopes to classify invertebrates into major taxonomic groups on the basis of morphological traits
- Assess how adaptations of invertebrates influence species and community interactions, and ecosystem function

Scientific Journal Article

Due: **30/10/19**
Weighting: **20%**

Students will complete a scientific research report, written in their own words and based on a data collected in class (externals will need to wait for internals to finish the pracs so all data is available). 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 collecting 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

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. You can check the supplementary exam information page on FSE101 in iLearn (bit.ly/FSESupp) for dates, and 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 light and scanning electron microscopes 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
- Effectively communicate biological research findings and concepts to diverse audiences including scientists and the general public

Delivery and Resources

Required unit materials

Lectures:

Attendance of lectures and practicals is compulsory and there is a participation mark for this unit. For the internal students lectures you will need to bring a device that can connect to the internet to lectures (either a laptop, tablet or smart phone - if you don't have one speak to me about this during the first lecture). For external students you will be required to view the lecture and complete an online quiz question.

Practicals:

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 from field and laboratory classes. 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 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 BIOL316:

- 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/ 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

Week	Date	Time	Location	Lecture	Topic	Lecturers

1	29/7/19	11:00 am	9 Wallys Walk (E6A) room 133	1	Introduction: fascinating world of invertebrates	Ajay Narendra
	30/7/19	12:00 pm	12 Second Way (C5A/C5B) - room 310	2	Phylogenetics	John Alroy
2	5/8/19	11:00 am	9 Wallys Walk (E6A) room 133	3	Invertebrate diversity 1	Ajay Narendra
	6/8/19	12:00 pm	12 Second Way (C5A/C5B) - room 310	4	Invertebrate diversity 2	Ajay Narendra
3	12/8/19	11:00 am	9 Wallys Walk (E6A) room 133	5	Foraging Ecology	Ajay Narendra
	13/8/19	12:00 pm	12 Second Way (C5A/C5B) - room 310	6	Microscopy	Sue Lindsay
4	19/8/19	11:00 am	9 Wallys Walk (E6A) room 133	7	Learning in Invertebrates	Ken Cheng
	20/8/19	12:00 pm	12 Second Way (C5A/C5B) - room 310	8	Camouflage	Ken Cheng
5	26/8/19	11:00 am	9 Wallys Walk (E6A) room 133	9	Interactions: Predation	Ajay Narendra
	27/8/19	12:00 pm	12 Second Way (C5A/C5B) - room 310	10	Interactions: Parasitism	Ajay Narendra
6	2/9/19	11:00 am	9 Wallys Walk (E6A) room 133	11	Biomonitoring and bioindicators	Ajay Narendra
	3/9/19	12:00 pm	12 Second Way (C5A/C5B) - room 310	12	Insect Immunology	Fleur Ponton
7	9/9/19	11:00 am	9 Wallys Walk (E6A) room 133	13	Insect in managed systems	Lizzy Lowe
	10/9/19	12:00 pm	12 Second Way (C5A/C5B) - room 310	14	Ecophysiology	Ajay Narendra
					Mid-Session Break	
8	30/9/19	11:00 am	9 Wallys Walk (E6A) room 133	15	Navigation	Ajay Narendra
	1/10/19	12:00 pm	12 Second Way (C5A/C5B) - room 310	16	Collective movement: slime moulds, robots	Chris Reid
9	7/10/19				Public Holiday	
	8/10/19	12:00 pm	12 Second Way (C5A/C5B) - room 310	17	Vision	Ajay Narendra
10	14/10/19	11:00 am	9 Wallys Walk (E6A) room 133	18	Mechanoreception	Ajay Narendra

	15/10/19	12:00 pm	12 Second Way (C5A/C5B) - room 310	19	Auditory, Magneto, Chemo reception	Ajay Narendra
11	21/10/19	11:00 am	9 Wallys Walk (E6A) room 133	20	Neurobiology	Ajay Narendra
	22/10/19	12:00 pm	12 Second Way (C5A/C5B) - room 310	21	Reproduction and mating I	Marie Herberstein
12	28/10/19	11:00 am	9 Wallys Walk (E6A) room 133	22	Reproduction and mating I	Marie Herberstein
	29/10/19	12:00 pm	12 Second Way (C5A/C5B) - room 310	23	Invertebrates & climate change	Lesley Hughes
13	4/11/19	11:00 am	9 Wallys Walk (E6A) room 133	24	Conservation issues	Lesley Hughes
	5/11/19	12:00 pm	12 Second Way (C5A/C5B) - room 310	25	Exam outline and revision	Ajay Narendra

*Lecture topics may change to accommodate guest lectures

Practicals (Internal)

Week	Prac Dates	Location	Prac time (3hrs)	Pracs
1	1/8/19	14 Eastern Rd, 160 Science Lab	1:00 pm	1. Phylogenetics
	2/8/19	14 Eastern Rd, 160 Science Lab	9:00 am	
2	8/8/19	14 Eastern Rd, 160 Science Lab	1:00 pm	2. Making Taxonomy Keys
	9/8/19	14 Eastern Rd, 160 Science Lab	9:00 am	
3	15/8/19	14 Eastern Rd, 160 Science Lab	1:00 pm	3. Microscopy/Imaging (Assessment)
	16/8/19	14 Eastern Rd, 160 Science Lab	9:00 am	
4	22/8/19	14 Eastern Rd, 160 Science Lab	1:00 pm	4. Microscopy/Imaging (Assessment)
	23/8/19	14 Eastern Rd, 160 Science Lab	9:00 am	
5	29/8/19	14 Eastern Rd, 160 Science Lab	1:00 pm	5. Biodiversity - pitfall traps
	30/8/19	14 Eastern Rd, 160 Science Lab	9:00 am	
6	5/9/19	14 Eastern Rd, 160 Science Lab	1:00 pm	6. Immunology
	6/9/19	14 Eastern Rd, 160 Science Lab	9:00 am	
7	12/9/19	14 Eastern Rd, 160 Science Lab	1:00 pm	7. Imunology stats (mid-session test)
	13/9/19	14 Eastern Rd, 160 Science Lab	9:00 am	
				Mid-Session Break
8	3/10/19	14 Eastern Rd, 160 Science Lab	1:00 pm	8. Foraging Prac (Assessment)

	4/10/19	14 Eastern Rd, 160 Science Lab	9:00 am	
9	10/10/19	14 Eastern Rd, 160 Science Lab	1:00 pm	9. Foraging Prac (Assessment)
	11/10/19	14 Eastern Rd, 160 Science Lab	9:00 am	
10	17/10/19	14 Eastern Rd, 160 Science Lab	1:00 pm	10.Foraging Prac (Assessment)
	18/10/19	14 Eastern Rd, 160 Science Lab	9:00 am	
11	24/10/19	14 Eastern Rd, 160 Science Lab	1:00 pm	No Prac private study for assessment
	25/10/19	14 Eastern Rd, 160 Science Lab	9:00 am	
12	31/10/19	14 Eastern Rd, 160 Science Lab	1:00 pm	No Prac - private study for exam
	1/11/19	14 Eastern Rd, 160 Science Lab	9:00 am	
13	7/11/19	14 Eastern Rd, 160 Science Lab	1:00 pm	No Prac - private study for exam

Practicals (OCS)

OCS	Time	Location	Pracs
Aug-31	9am-12pm	14 Eastern Rd, 160 Science Lab	Phylogenetics
Aug-31	1pm-5pm	14 Eastern Rd, 160 Science Lab	Mircroscopy (Assessment)
Sep-23	9am-12pm	14 Eastern Rd, 160 Science Lab	Taxonomic Keys
Sep-23	1pm-5pm	14 Eastern Rd, 160 Science Lab	Biodiversity and pitfall traps
Sep-24	9am-12pm	14 Eastern Rd, 160 Science Lab	Immunology
Sep-24	1pm-5pm	14 Eastern Rd, 160 Science Lab	Immunology (analysis)
Sep-25	9am-12pm	14 Eastern Rd, 160 Science Lab	mid-session test and Foraging Prac
Sep-25	1pm-5pm	14 Eastern Rd, 160 Science Lab	Foraging Prac
Sep-26	9am-12pm	14 Eastern Rd, 160 Science Lab	Foraging Prac
Sep-26	1pm-5pm	14 Eastern Rd, 160 Science Lab	Foraging Prac

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.)*

Undergraduate 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

Special consideration / Disruptions to studies

If you have a serious and unavoidable disruption during your studies you can make an application for special consideration Ask.mq.edu.au using the "Disruptions to Studies form." Disruptions need to be filed within 5 days of the disruption and have the correct supporting documentation. For more information on Disruptions to Studies notifications please refer to the university policy (http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) and procedure (http://www.mq.edu.au/policy/docs/disruption_studies/procedure.html).

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

If you feel that you are not coping and could use some extra help or guidance, the Faculty of Science and Engineering has dedicated academic support officers to help you settle into studies and reach your full potential. If you are struggling and don't know where to turn for help, contact Helene or Michele (available for appointments on Tuesday, Wednesday, Thursday 10-3pm). Please contact them on 9850-8348, or email sci.studentsupport@mq.edu.au or drop in to the FSE Student Centre and make an appointment to be called back.

Some pearls of wisdom:

- Don't take on too much work
- Don't leave things to the last minute
- If anything is not making sense, get help

For **Counselling, Disability and Student Advocacy Services** please contact Campus Wellbeing 9850 7497, Email: campuswellbeing@mq.edu.au

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.

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 outcome

- Create hypotheses and design experiments to test those hypothesis by collecting appropriate data

Assessment tasks

- Scientific Journal Article
- 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

- Assess how adaptations of invertebrates influence species and community interactions, and ecosystem function
- Create hypotheses and design experiments to test those hypothesis by collecting appropriate data
- Effectively communicate biological research findings and concepts to diverse audiences including scientists and the general public

Assessment tasks

- Microscopy
- Mid-Session Test
- Scientific Journal Article
- 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 outcome

- Create hypotheses and design experiments to test those hypothesis by collecting appropriate data

Assessment tasks

- Lecture Participation
- Scientific Journal Article
- 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

- Competently use light and scanning electron microscopes 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 collecting appropriate data
- Critically evaluate scientific hypotheses by statistically analysing data, and accurately interpreting results of those analyses

Assessment tasks

- Lecture Participation
- Early assessment quiz
- Microscopy
- Mid-Session Test
- Scientific Journal Article
- 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

- 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 collecting 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

Assessment tasks

- Early assessment quiz
- Microscopy
- Mid-Session Test
- Scientific Journal Article
- 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

- Create hypotheses and design experiments to test those hypothesis by collecting 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

Assessment tasks

- Microscopy
- Scientific Journal Article
- 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 outcome

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

Assessment tasks

- Microscopy
- Scientific Journal Article
- 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:

Assessment tasks

- Scientific Journal Article
- Final exam

Changes from Previous Offering

Lecture participation.

Changes since First Published

Date	Description
17/07/2019	Unit schedule has been updated