



BIOL121

Marine Biology and Ecosystems

S1 Day 2013

Biological Sciences

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General Information

Unit convenor and teaching staff

Unit Convenor

Leanne Armand

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E8C 157 (entry via Climate Futures E8C 153)

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Guest Lecturer

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9-5

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E8A 104

Credit points
3
Prerequisites
Corequisites
Co-badged status
Unit description
<p>This unit provides students with a background to marine sciences focusing primarily on the ocean environment, its habitats, ecosystems and organisms characterising our blue planet. The unit develops basic knowledge of the chemical, physical and biological disciplines that are interwoven in the study of the marine environment and its organisms. The unit is a first step for those considering a career in this field. The unit focuses on the basic but very important physical and chemical properties of the oceans that constrain life, habitats and the dispersion of biological. It then develops into consecutive sections of the unit that are concerned with the variety of life forms and the major marine habitats and ecosystems. Three practicals will be held off campus and will involve additional entry fee costs (eg, Taronga Zoo, Aquariums).</p>

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:

Explain how chemistry and oceanography constrains life in marine environments.

Describe the main forms of life in the oceans, their discriminating characteristics, habitats and methods of dispersal.

Identify, summarise and critically evaluate primary (journal articles) and secondary (books and reports) literature pertaining to marine topics.

Effectively communicate aspects of marine biology, of interest to the general public, using visually effective and appropriately worded summary sheets.

Work effectively in a team to research and communicate marine science.

Make clear, accurate descriptions of field and laboratory observations.

Identify the most appropriate type of graph for summarising different types of basic data, and draw these graphs using a widely available graphing software package.

Assessment Tasks

Name	Weighting	Due
<u>Weekly Quiz</u>	10%	Weekly
<u>Fact Sheet Assignment</u>	10%	22nd March, 2013
<u>Fact Sheet Presentation</u>	5%	22 March, 2013
<u>Fish Taxonomy Practical</u>	5%	5th April, 2013
<u>Animal Behaviour Practical</u>	10%	5th April, 2013
<u>Harbour excursion report</u>	20%	24th May
<u>Exam</u>	40%	In Exam Period

Weekly Quiz

Due: **Weekly**

Weighting: **10%**

Students will have a series of multi-choice, short answer or diagramatic questions to answer each week based on lecture content and/or associated reading. The quizzes will be posted on-line through iLearn at the end of the week's second lecture and are accessible for assessment for one week only. Quizzes can be accessed as basic review material for the final exam. Grades from the quiz will contribute up to 10% of a student's final grade.

On successful completion you will be able to:

- Explain how chemistry and oceanography constrains life in marine environments.
- Describe the main forms of life in the oceans, their discriminating characteristics, habitats and methods of dispersal.
- Make clear, accurate descriptions of field and laboratory observations.
- Identify the most appropriate type of graph for summarising different types of basic data, and draw these graphs using a widely available graphing software package.

Fact Sheet Assignment

Due: **22nd March, 2013**

Weighting: **10%**

In collaboration with the Sydney Institute of Marine Science (SIMS) public-oriented fact sheets, based on the Sydney Harbour marine environment and its inhabitants, will be produced by students. Working in pairs, students will be assigned a random marine topic to produce a two-

page fact sheet. The five best fact sheets will go in the running for selection to be printed into real fact sheets by the Sydney Institute of Marine Science (SIMS) for public dispersion. The fact sheets are uploaded to iLearn and are assessed against a set criteria provided to students and by TURNITIN (anti-plagiarism software). All images must be either owned by the student or Creative Commons attributed (i.e. they can not be copied or manipulated from the web). One mandatory tutorial (with an associated pre-tute task) is associated with this activity where library search skills specific to marine science are explained and put into practice. Students have two weeks to complete the task as a team in their own time. Word length: maximum 1000 words.

This is an early-assessment assignment to provide students with early feedback on University-level work expectations.

On successful completion you will be able to:

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- Describe the main forms of life in the oceans, their discriminating characteristics, habitats and methods of dispersal.
- Identify, summarise and critically evaluate primary (journal articles) and secondary (books and reports) literature pertaining to marine topics.
- Effectively communicate aspects of marine biology, of interest to the general public, using visually effective and appropriately worded summary sheets.
- Work effectively in a team to research and communicate marine science.

Fact Sheet Presentation

Due: **22 March, 2013**

Weighting: **5%**

Students will present their fact sheet topic (as pairs) as a short presentation (5 minutes plus questions) using an appropriate presentation program (e.g. Powerpoint, Prezi). Both students must speak equally through the presentation. Peer-assessment is incorporated into this activity.

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- Describe the main forms of life in the oceans, their discriminating characteristics, habitats and methods of dispersal.
- Identify, summarise and critically evaluate primary (journal articles) and secondary (books and reports) literature pertaining to marine topics.
- Effectively communicate aspects of marine biology, of interest to the general public, using visually effective and appropriately worded summary sheets.
- Work effectively in a team to research and communicate marine science.

Fish Taxonomy Practical

Due: **5th April, 2013**

Weighting: **5%**

This practical on Friday the 5th April, 2013, is hands-on and laboratory-based. Students will be guided through fish anatomical features that aid in the identification of New South Wales fish through an on-line taxonomic guide. You will be challenged on your abilities to identify mystery fish from your new taxonomic skills.

Please note: Closed-in footwear is mandatory, and students are strongly-advised to bring a lab coat to protect their clothing.

On successful completion you will be able to:

- Explain how chemistry and oceanography constrains life in marine environments.
- Make clear, accurate descriptions of field and laboratory observations.
- Identify the most appropriate type of graph for summarising different types of basic data, and draw these graphs using a widely available graphing software package.

Animal Behaviour Practical

Due: **5th April, 2013**

Weighting: **10%**

This practical is preceeded by a tutorial (15th March) detailing the practical expectations. In the tutorial students will be exposed to field notebook styles and advice on data collection. Students will be allocated a particular marine organism found at the Taronga Zoo to observe the behaviour of in reference to zoo keeper advice. Students will be assessed on their Field notebook and the data that they collect, collate, summarise and present in an appropriate graph form.

Students have 3 weeks (inclusive of the Easter break) to visit the zoo in their own time and undertake their observations before the deadline.

Please note: Full-time enrolled students will incur a \$31.50 entry fee charge to Taronga Zoo on presentation of their current student card and any additional transport and/or parking charges to/from the Zoo. Failure to present a current Full-time student card on entry will mean you are charged at the Full Adult entry fee of \$44.00. There are no discounts for part-time enrolled students.

On successful completion you will be able to:

- Make clear, accurate descriptions of field and laboratory observations.
- Identify the most appropriate type of graph for summarising different types of basic data, and draw these graphs using a widely available graphing software package.

Harbour excursion report

Due: **24th May**

Weighting: **20%**

We take to the Harbour on Friday the 10th May to expose students to boat-based sampling of the physical environment and its biological micro-organisms. Students will be expected to take detailed notes in their field notebook, document parameters and observations while on the water and then try their hand at identifying the micro-organisms they have just sampled. Students will be assessed on their field book and short report on their observations. Word limitation for report: 1000-2000 words.

Please Note: Buses from Macquarie University will be organised to transport students to/from SIMS (Chowder Bay) relevant to a student's practical session. Alternatively, students can make their own way there by public transport (Bus 244 from near Wynyard Station - pre-paid tickets required, 1 bus per hour generally). Car parking at, or near, SIMS is possible but not recommended due to the fact that it is metered, expensive and well patrolled by parking inspectors.

On successful completion you will be able to:

- Explain how chemistry and oceanography constrains life in marine environments.
- Make clear, accurate descriptions of field and laboratory observations.
- Identify the most appropriate type of graph for summarising different types of basic data, and draw these graphs using a widely available graphing software package.

Exam

Due: **In Exam Period**

Weighting: **40%**

Students will be assessed on their understanding of basic concepts covered in the unit by means of a multichoice questions. Additional short answer questions that test their understanding of the marine environment and ecosystems will also be included. A student **MUST** pass the exam (>50%) to obtain a pass grade in this unit.

On successful completion you will be able to:

- Explain how chemistry and oceanography constrains life in marine environments.
- Describe the main forms of life in the oceans, their discriminating characteristics, habitats and methods of dispersal.
- Make clear, accurate descriptions of field and laboratory observations.
- Identify the most appropriate type of graph for summarising different types of basic data, and draw these graphs using a widely available graphing software package.

Delivery and Resources

CHANGES TO THIS UNIT IN 2013

This unit is new in 2013. There are no changes from previous years.

DELIVERY

This unit has two lectures per week and 1 tutorial/prac session (2hrs) almost every week in the first half of the semester and twice in the second half of the semester. One of the second semester practical sessions is conducted at the Sydney Institute of Marine Sciences (see the timetable for set dates and times).

PRACTICALS

Two compulsory off-campus practicals are associated with this unit, each has a pre-prac tutorial. One practical can be undertaken relevant to a student's personal timetable prior to the assessment submission deadline. The other practical is set for the 10th May and is compulsory for all students in their selected practical time. No extensions or alternative timings are provided for off-campus practicals.

For all tutorials and practicals closed in footwear is mandatory. Students will be excluded from the laboratory or practical if they do not have appropriate shoes.

TECHNOLOGY USED

Audio (and some video) lecture recordings of the lecture presentation are normally provided via ECHO-360. This can be accessed via direct links through iLearn on BIOL121's homepage on iLearn. These recordings are not a substitute for attendance, and should only be considered as a starting point for revision.

We use Microsoft EXCEL™ as a basic statistical package during practicals. However, you can use the Macquarie supported, free-access, to Minitab. The latest version of Minitab (Minitab 16) can be downloaded from the myMQportal website (<https://my.mq.edu.au/>) by selecting the drop-down menu "online Tools" and then "Software Downloads".

During practicals you may wish to access the free web stats sites: vassarstats

USE OF ANTI-PLAGIARISM TECHNOLOGY

Macquarie University treats plagiarism very seriously with harsh penalties for students that consider this an option in their education. Plagiarism is not tolerated at any level or in any manner. **Ensure that your work is your own and is not shared with others.** Student work assessed in BIOL121 will be scrutinised by TURNITIN and tutor assessments. Aside from failing a set task, all instances of plagiarism will be reported to the department and kept on record for the entirety of your degree. Escalation to the Faculty level is at the discretion of the Head of Department.

TEXT BOOK

There is no compulsory textbook, however, we highly recommend that students, particularly those interested in pursuing Marine Science, purchase their own copy of the following as we can

not guarantee a copy will be available for you to use from the library:

P.R. Pinet: *An Invitation to Oceanography*, **5th Edition**. (Available in the co-op bookshop or second hand).

One copy can be found in the RESERVE collection of the library.

If you need assistance with writing reports for Biological Sciences we highly recommend the following as a very useful guide for the next three years of your degree:

J.A. Pechenik: *A short guide to writing about biology*. 7th or 8th Edition (Available in the co-op bookshop or second hand or many copies in the library).

Unit Schedule

BIOL121, Semester 1, 2013

Week	Date	Lecture/Prac	Topic
1	25 Feb	Practical Group 1	<i>No class</i>
1	26 Feb	Lecture 1	Course Introduction
1	27 Feb	Lecture 2	Ocean as Habitat- properties
1	1 March	Practical Groups 2-5	<i>No class</i>
2	4 March	Practical group 1.	Library skills and Fact sheet outline
Note: Pre-practical task			
2	5 March	Lecture 3	Ocean as Habitat - Motion
2	6 March	Lecture 4	Life as we don't know it- adaptation & evolutionary tactics
2	8 March	Practical Groups 2-5	Library skills and Fact sheet outline
Note: Pre-practical task			
3	11 March	Practical group 1	Fact Sheet Presentation and Taronga Zoo practical outlines
3	12 March	Lecture 5	Palaeobiogeography and Palaeoceanography
3	13 March	Lecture 6	Modern marine ecosystems, habitats and communities
3	15 March	Practical Group 2-5	Fact Sheet Presentation and Taronga Zoo practical outlines

4	18 March	Practical Group 1	Student Presentations
4	18 March	Practical Group 1	Fact sheets due Group 1
4	19 March	Lecture 7	Ecosystems 1: Polar
4	20 March	Lecture 8	Ecosystems 2: Temperate
4	22 March	Practical Groups 2-5	Student Presentations
4	22 March	Practical Groups 2-5	Fact sheets due Groups 2-5
5	25 March	Practical Group 1	<i>No class</i>
5	26 March	Lecture 9	Ecosystems 3: Tropical
5	27 March	Lecture 10	Ecosystems 4: Deep Sea
5	29 March	Practical Groups 2-5	<i>Good Friday Holiday - No class</i>
6	1 April	Practical Group 1	<i>Easter Monday Holiday- No class</i>
6	2 April	Lecture 11	<i>Easter Tuesday Holiday - No class</i>
6	3 April	Lecture 12	Ecosystems 5: Microbial
6	5 April	Practical Groups 2-5	Fish taxonomy and identification
6	5 April	All students - Zoo field notebook and report due	
7	8 April	Practical Group 1	Fish taxonomy and identification
7	9 April	Lecture 11	Animal Ethics
7	10 April	Lecture 12	Fish Behaviour
7	12 April	Practical Groups 2-5	<i>No class</i>

Session 1 Break (13th - 28th April, 2013)

Week	Date	Lecture/Prac	Topic
8	29 April	Practical Group 1	Outline of Sydney Harbour Practical
8	30 April	Lecture 13	Bacteria
8	1 May	Lecture 14	Viruses
8	3 May	Practical Groups 2-5	Outline of Sydney Harbour Practical

9	6 May	Practical Group 1	TBA - Class will be on Friday at SIMS
9	7 May	Lecture 15	Primary production and phytoplankton
9	8 May	Lecture 16	Marine Plants
9	10 May	Practical Groups 2-5	Sydney Harbour Practical at SIMS
10	13 May	Practical Group 1	<i>No class</i>
10	14 May	Lecture 17	Marine Invertebrates
10	15 May	Lecture 18	Marine Vertebrates
10	17 May	Practical Groups 2-5	<i>No class</i>
11	20 May	Practical Group 1	<i>No class</i>
11	21 May	Lecture 19	Marine Trophic Relationships
11	22 May	Lecture 20	Guest speaker
11	24 May	Practical Groups 2-5	<i>No class</i>
11	24 May	ALL students Sydney Harbour Field Book and Report due	
12	27 May	Practical Group 1	<i>No class</i>
12	28 May	Lecture 21	Living Marine Resources
12	29 May	Lecture 22	Indigenous Marine History and Learning
12	31 May	Practical Groups 2-5	<i>No class</i>
13	3 June	Practical Group 1	<i>No class</i>
13	4 June	Lecture 23	Marine Laws and Regulations
13	5 June	Lecture 24	Unit Summary
13	7 June	Practical Groups 2-5	<i>No class</i>

10-28 June EXAM PERIOD 1 Exam

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://www.mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy <http://www.mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://www.mq.edu.au/policy/docs/grading/policy.html>

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

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Special Consideration Policy http://www.mq.edu.au/policy/docs/special_consideration/policy.html

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

Student Support

Macquarie University provides a range of Academic Student Support Services. Details of these services can be accessed at: <http://students.mq.edu.au/support/>

UniWISE provides:

- Online learning resources and academic skills workshops http://www.students.mq.edu.au/support/learning_skills/
- Personal assistance with your learning & study related questions.
- The Learning Help Desk is located in the Library foyer (level 2).
- Online and on-campus orientation events run by Mentors@Macquarie.

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

Details of these services can be accessed at <http://www.student.mq.edu.au/ses/>.

IT Help

If you wish to receive IT help, we would be glad to assist you at <http://informatics.mq.edu.au/help/>.

When using the university's IT, you must adhere to the [Acceptable Use Policy](#). The policy applies to all who connect to the MQ network including students and it outlines what can be done.

Graduate Capabilities

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, summarise and critically evaluate primary (journal articles) and secondary (books and reports) literature pertaining to marine topics.
- Effectively communicate aspects of marine biology, of interest to the general public, using visually effective and appropriately worded summary sheets.
- Work effectively in a team to research and communicate marine science.

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

- Effectively communicate aspects of marine biology, of interest to the general public, using visually effective and appropriately worded summary sheets.

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

- Explain how chemistry and oceanography constrains life in marine environments.
- Describe the main forms of life in the oceans, their discriminating characteristics, habitats and methods of dispersal.
- Identify, summarise and critically evaluate primary (journal articles) and secondary (books and reports) literature pertaining to marine topics.
- Make clear, accurate descriptions of field and laboratory observations.
- Identify the most appropriate type of graph for summarising different types of basic data, and draw these graphs using a widely available graphing software package.

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

- Explain how chemistry and oceanography constrains life in marine environments.
- Describe the main forms of life in the oceans, their discriminating characteristics, habitats and methods of dispersal.
- Identify, summarise and critically evaluate primary (journal articles) and secondary (books and reports) literature pertaining to marine topics.
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- Identify the most appropriate type of graph for summarising different types of basic data, and draw these graphs using a widely available graphing software package.

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

- Explain how chemistry and oceanography constrains life in marine environments.
- Describe the main forms of life in the oceans, their discriminating characteristics, habitats and methods of dispersal.
- Identify, summarise and critically evaluate primary (journal articles) and secondary (books and reports) literature pertaining to marine topics.
- Work effectively in a team to research and communicate marine science.
- Make clear, accurate descriptions of field and laboratory observations.
- Identify the most appropriate type of graph for summarising different types of basic data, and draw these graphs using a widely available graphing software package.

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

- Effectively communicate aspects of marine biology, of interest to the general public, using visually effective and appropriately worded summary sheets.
- Identify the most appropriate type of graph for summarising different types of basic data, and draw these graphs using a widely available graphing software package.

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, summarise and critically evaluate primary (journal articles) and secondary (books and reports) literature pertaining to marine topics.
- Effectively communicate aspects of marine biology, of interest to the general public, using visually effective and appropriately worded summary sheets.
- Work effectively in a team to research and communicate marine science.
- Make clear, accurate descriptions of field and laboratory observations.

- Identify the most appropriate type of graph for summarising different types of basic data, and draw these graphs using a widely available graphing software package.

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

- Effectively communicate aspects of marine biology, of interest to the general public, using visually effective and appropriately worded summary sheets.
- Work effectively in a team to research and communicate marine science.

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 outcome

- Work effectively in a team to research and communicate marine science.

Changes since First Published

Date	Description
27/02/2013	Typos fixed, changes to dates of practicals and lectures given the large increase in student numbers. Added an additional reference to support student writing in biology.