BIOL261

History of Life

S2 External 2014

Dept of Biological Sciences

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General Information

Unit convenor and teaching staff
Unit Convenor
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Credit points
3

Prerequisites
12cp

Corequisites

Co-badged status

Unit description
The aim of this unit is to provide students with an introduction to the history and evolution of life on Earth. In this unit, students will be exposed to important core concepts in palaeobiology such as evolution and extinction, functional morphology and biostratigraphy, and will investigate the morphology and evolutionary significance of the most important invertebrate and vertebrate animals groups (such as trilobites and dinosaurs) and plants in the fossil record. Combined with the opportunity to work with real fossil material during practical classes, students will also learn how fossils are used in applied palaeontology to solve various biological, ecological and geological problems. This approach gives students the opportunity to develop a deep time perspective to many of the environmental issues and challenges facing the world today. A voluntary, one day excursion to the Hunter Valley is also available and will allow students to observe fossils in the field and to collect their own fossil material.

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:

1. Use fossils to interpret and reconstruct the history of life on Earth.
2. Identify the major morphological features of important invertebrate and vertebrate groups preserved in the fossil record.
3. Describe the significant evolutionary trends displayed by important animal and plant groups preserved in the fossil record.
4. Use fossils to solve basic biological, ecological, environmental and geological problems.
5. Undertake basic studies and interpretations of biostratigraphy, functional morphology, palaeoenvironmental reconstruction and palaeoclimatic interpretation.
6. Use both verbal and written communication techniques to present your own ideas, analyses and interpretations of scientific evidence presented in the primary scientific literature.

Assessment Tasks

Name	Weighting	Due
Discussion topic	10%	TBA
online lab quizzes	30%	TBA
Major Assignment	20%	TBA
Final Exam	40%	TBA

Discussion topic

Due: **TBA**
Weighting: **10%**

2. Discussion topic (10%). The Discussion Topic will provide you with the opportunity to read a series of primary scientific papers on a hotly debated topic in palaeontology. This will allow you to become familiar with the way scientists communicate their ideas and gives you the chance to formulate your own conclusions regarding the strengths and weaknesses of the data presented in the published papers

An introduction to the Discussion Topic and the questions you need to address will be provided separately on the iLearn site. Copies of all the relevant papers for the Discussion Topic are available from e-Reserve in the Library. **You are required to submit a written response to each of the questions asked and to provide an evaluation of all the pertinent evidence and**

data related to the Discussion Topic. It is always a good idea to carefully read each of the core papers several times so that you can come to grips with the main thrust(s) that each one presents. Your written response should be word processed (hand written Discussion Topics won't be accepted) and properly referenced using the Harvard Referencing System.

On successful completion you will be able to:

- 1. Use fossils to interpret and reconstruct the history of life on Earth.
- 3. Describe the significant evolutionary trends displayed by important animal and plant groups preserved in the fossil record.
- 5. Undertake basic studies and interpretations of biostratigraphy, functional morphology, palaeoenvironmental reconstruction and palaeoclimatic interpretation.
- 6. Use both verbal and written communication techniques to present your own ideas, analyses and interpretations of scientific evidence presented in the primary scientific literature.

online lab quizzes

Due: **TBA**
Weighting: **30%**

1. Online Quizzes (30%). Each laboratory session in BIOL261 will be assessed via an online, multiple choice quiz on iLearn. The questions for each quiz will be based directly on work completed during each laboratory session. Following the Lab classes each week you will have 6 days to complete the associated lab quiz. Each quiz is marked out of 10 and you will have 20 minutes to answer all questions. You may only attempt each quiz once. Students who forget to complete the quiz or simply do not attempt the quiz will have a zero mark recorded for that quiz. External students will complete the quizzes after each of the on-campus sessions.

On successful completion you will be able to:

- 1. Use fossils to interpret and reconstruct the history of life on Earth.
- 2. Identify the major morphological features of important invertebrate and vertebrate groups preserved in the fossil record.
- 3. Describe the significant evolutionary trends displayed by important animal and plant groups preserved in the fossil record.
- 4. Use fossils to solve basic biological, ecological, environmental and geological

problems.

- 5. Undertake basic studies and interpretations of biostratigraphy, functional morphology, palaeoenvironmental reconstruction and palaeoclimatic interpretation.

Major Assignment

Due: **TBA**
Weighting: **20%**

3. Major assignment (20%). Each student is expected to choose and submit **ONE** Major Assignment from the two possible topics (these will be provided separately on the iLearn website for the unit.

Marks for the Major Assignment will be given for:

1. Scientific evaluation or how well you have supported your answers using **evidence** from the primary scientific literature.
2. Logical organisation, formatting, sentence structure and style / grammar / spelling.
3. Relevance, clarity and acknowledgement of all figures, graphs and tables. Figures **MUST** be used to support your views in the Major Assignment.
4. Complete reference list and the correct and comprehensive citation of all sources using the Harvard Referencing System.

Additional information on the marking criteria will be provided in class.

Important points to note regarding the format and structure of the Major Assignment:

- Make sure you carefully read the questions and associated core papers for your chosen topic. ***Your assignment must precisely and completely address each question posed.*** Do not waste time and space reviewing the contents of each paper or bulking out the assignment with irrelevant 'waffle'.
- The assignment should be **word processed** using a 12 pt font with **double spacing** throughout, and **should not exceed 2000 words** (this is approximately equivalent to 5-6 double spaced A4 pages for text in 12 pt font and 2.5 cm margins). Hand written assignments won't be accepted.
- The word limit does not include supporting figures, graphs, tables or the reference list.
- An accurate **word count** should be included on the coversheet for the assignment.
- You **MUST** include figures, graphs and/or tables in your assignment. Figures are vital as supporting evidence for your arguments and point of view. Make sure all figures, graphs, tables etc are referred to in the text and are included at relevant places in the text – do

not lump them all together at the end of the assignment.

- A set of core papers for both assignment topics are available in e-Reserve. The core papers are meant to provide a starting point for your reading, but are not intended to be comprehensive. You are strongly encouraged to access other relevant primary scientific literature sources **outside** of the core papers. A separate handout entitled '*Search Strategies in the Library*' is available on iLearn to help you access the core papers held in e-Reserve and to search out other relevant papers.
- **Use only primary reference sources from scientific texts and journals.** Avoid using secondary (and usually dated) sources such as encyclopedias or Readers Digest type material. **Don't use Wikipedia** (an online reference encyclopedia) as a reference source. Although this site has improved in recent years, it still has plenty of factual errors. Since Wikipedia merely summarises conclusions and does not present evidence, it is a classic example of a secondary source.
    - **Primary source** = a paper published in a peer reviewed, international scientific journal that presents raw scientific data collected in the field or the lab, interpretation of results and conclusions. Primary sources are written by the scientists who undertake the original investigation/experimentation. There are lots of primary sources (especially scientific journals) in the Library and you can search through topics using keyword searches in bibliographic databases such as GEOREF or BIOSIS (see the separate handout '*Search Strategies in the Library*' available on iLearn).
    - **Secondary source** = a review or compilation of the research performed by someone other than the author. Examples of secondary sources include textbooks, popular science magazines (e.g. *New Scientist*), newspapers, Readers Digest and most web sites (e.g. Wikipedia). There are some exceptions (e.g. the web journal, *Palaeontologica Electronica*, a peer reviewed scientific journal only available online). While some secondary sources can provide accurate information, they often only present the conclusions and not the raw data or evidence that the conclusions are based on. The reader therefore has no way of checking the data to see if alternative interpretations or conclusions can be reached. Secondary sources can also include material that is out of date, misinterpreted, or simply wrong.
- Since only one Major Assignment is scheduled for BIOL261, you are required to research and prepare your work to a **high standard**. You will need to rigorously assess and evaluate the data/evidence presented in each paper and to frame your answer to

the questions posed based on supporting evidence and data from the literature. I want **YOUR** critical evaluation/synthesis of the topic, not someone else's. Don't fall into the trap of simply summarising the conclusions or interpretations of the authors of the core papers. Your job is to critically evaluate **the evidence** provided in support of the various interpretations. To do this properly, you will need to read widely and investigate the details of unfamiliar concepts and terminology.

- Previous experience has shown that students who leave starting their Major Assignment to a few days prior to submission usually get a correspondingly low mark.
- Make sure all information sources used are cited in the text in the appropriate manner.
- A full reference list in alphabetical order should be included at the end of the assignment. Only sources cited in the main text of the assignment should be included in the reference list. **You MUST use the Harvard Referencing Style when writing your assignment** (see separate handout entitled '*Harvard Referencing Style for Palaeontology Assignments at Macquarie University*' available on iLearn). This means that the use of footnotes or numbered reference citations (Oxford referencing style) **should be completely avoided**.
- Direct copying from the work of others (including other students) is **plagiarism**. The University has very strict policies relating to this type of cheating which may involve failure in the unit. See Policy Central for full details on how the university deals withs students who plagiarise.
- Before handing in your assignment you must submit it to *Turnitin*, an online plagiarism checking program through the iLearn website for BIOL261.
- If you have any queries regarding the Major Assignment please contact Glenn.

On successful completion you will be able to:

- 1. Use fossils to interpret and reconstruct the history of life on Earth.
- 3. Describe the significant evolutionary trends displayed by important animal and plant groups preserved in the fossil record.
- 5. Undertake basic studies and interpretations of biostratigraphy, functional morphology, palaeoenvironmental reconstruction and palaeoclimatic interpretation.
- 6. Use both verbal and written communication techniques to present your own ideas, analyses and interpretations of scientific evidence presented in the primary scientific literature.

Final Exam

Due: **TBA**
Weighting: **40%**

Final Exam

On successful completion you will be able to:

- 1. Use fossils to interpret and reconstruct the history of life on Earth.
- 2. Identify the major morphological features of important invertebrate and vertebrate groups preserved in the fossil record.
- 3. Describe the significant evolutionary trends displayed by important animal and plant groups preserved in the fossil record.
- 4. Use fossils to solve basic biological, ecological, environmental and geological problems.

Delivery and Resources

Required and recommended resources

Occupational health and safety. Due to OH&S regulations, all students **MUST** wear fully enclosed footwear (i.e. no thongs) at all times during laboratory sessions in E5A220. Students without proper footwear will be unable to enter the lab. Food and drink may not be consumed in the lab at any time either.

Textbook. There is no prescribed textbook for BIOL261, but one text is **highly recommended** since it embraces most of the topics to be covered. Unfortunately, like most textbooks, it is somewhat expensive (~$90-100) and so purchase of the text is certainly not compulsory, but it would be a useful study tool. You may be able to pick up a cheaper second hand copy online. The text is:

BENTON, M.J. & HARPER, D.A.T. (2009). *Introduction to paleobiology and the fossil record.* Wiley-Blackwell, United Kingdom, 592 pp. ISBN 978-1-4051-8646-9.

I have arranged for a limited number (30 copies) of Benton & Harper (2009) to be available in the

Co-Op bookshop for purchase (on a first in, first served basis). Two copies of Benton & Harper (2009) are also available in the Library. A companion website for this text is available at: http://www.blackwellpublishing.com/paleobiology/. Suggested readings to supplement the information provided in the lectures and laboratory sessions are indicated in the Unit Schedule.

Recommended reading. There are a number of other useful textbooks in the Library (listed below) that you may find helpful as supplementary reading for BIOL261. These will be located in Special Reserve for the duration of the semester.

ADRAIN, J.M., EDGECOMBE, G.D. & LIEBERMAN., B.S. (eds) 2001. *Fossils, phylogeny, and form: an analytical approach*. Kluwer Academic, New York. **[QE719.8.F68]**

AUSICH, W.I. & LANE, N.G. 1999. *Life of the past*, 4th edn. Prentice Hall, New Jersey. **[QE711.2.L35]**

BENTON, M.E. (ed.) 1993. *The fossil record 2*. Chapman & Hall, London. **[QE723.P67]**

BLACK, R.M. 1988. *The elements of palaeontology*, 2nd edn. Cambridge University Press, Cambridge. **[QE711.2.B5]**

BOARDMAN, R.S., CHEETHAM, A.H. & ROWELL, A.J. 1987. *Fossil invertebrates*. Blackwell Scientific Press, Palo Alto. **[QE770.F67]**

CLACK, J.A. 2002. *Gaining ground: the origin and evolution of tetrapods*. Indiana University Press, Indiana. **[QE852.D5.C57]**

CLARKSON, E.W. 1986. *Invertebrate palaeontology and evolution*, 2nd edn. Allen & Unwin, London. **[QE770.C55/1986]**

CLARKSON, E.W. 1993. *Invertebrate palaeontology and evolution*, 3rd edn. Chapman & Hall, London. **[QE770.C56/1993]**

CLARKSON, E.W. 1998. *Invertebrate palaeontology and evolution*, 4th edn. Blackwell Science, Oxford. **[QE 770.C56/1998]**

COWEN, R. 1995. *History of life*, 2nd edn. Blackwell Scientific Publications, Boston. **[QE711.2.C68]**

COWEN, R. 2000. *History of life*, 3rd edn. Blackwell Scientific Publications Boston. **[QE711.2.C68]**

COWEN, R. 2005. *History of life*, 4th edn. Blackwell Scientific Publications, Boston. **[QE711.2.C68]**

DOYLE, P. 1996. *Understanding fossils: an introduction to invertebrate palaeontology*. Wiley, New York. **[QE770.D69]**

ELDREDGE, N. & ALCOSSER, M. 1991. *Fossils: the evolution and extinction of species*. H.N. Abrams, New York. **[QE711.2.E47]**

FOOTE, M. & MILLER, A.I. 2007. *Principles of paleontology*, 3rd edn. W.H. Freeman, New York. **[QE711.2.F66]**

FORTEY, R.A. 2002. *Fossils: the key to the past*. Natural History Museum Publication, London. **[QE711.3.F67]**

HALLAM, A. & WIGNALL, P.B. 1997. *Mass extinctions and their aftermath*. Oxford University Press, Oxford. **[QE721.2.E97.H35]**

JABLONSKI, D., ERWIN, D.H. & LIPPS, J.H. (eds) 1996. *Evolutionary paleobiology*. University of Chicago Press, Chicago. **[QE721.2.E85.E96]**

LANE, N.G. 1992. *Life of the past*. New York, Macmillan Publications. **[QE711.2.L35]**

LEHMANN, U. & HILLMER, G. 1983. *Fossil invertebrates*. Cambridge University Press, Cambridge. **[QE770.L4313]**

LIEBERMAN, B.S. 2000. *Paleobiogeography: using fossils to study global change, plate tectonics, and evolution*. Kluwer Academic, New York. **[QE721.2.P24.L54]**

LIPPS, J.H. & SIGNOR, P.W. (eds) 1992. *Origin and evolution of the Metazoa*. Plenum Press, New York. **[QE721.2.E85.O75]**

MURRAY, J.W. (ed.) 1985. *Atlas of invertebrate macrofossils*. Longmann Press, London. **[QE770.A87]**

KNOLL, A.H. 2003. *Life on a young planet: the first three billion years of evolution on earth*. Princeton University Press, New Jersey. **[QH325.K54 2003]**

RAUP, D.M. & STANLEY, S.M. 1978. *Principles of paleontology*. W.H. Freeman, San Francisco. **[QE711.2.R37]**

SCHOPF, J.W. 1999. *Cradle of life: the discovery of earth's earliest fossils*. Princeton University Press, New Jersey. **[QE719.S36]**

SMITH, A.B. 1994. *Systematics and the fossil record: documenting evolutionary patterns*. Blackwell Scientific Publications, Oxford. **[QE721.2.E85.S65]**

STANLEY S.M. 1989. *Earth and life through time*, 2nd edn. W.H. Freeman, New York. **[QE28.3.S73]**

STEARN, C.W. & CARROLL, R.L. 1989. *Paleontology: the record of life*. Wiley, New York. **[QE711.2.S74]**

WARD, P.D. 1998. *Time machines: scientific explorations in deep time*. Copernicus, New York. **[QE711.2.W37/1998]**

Unit Schedule

WEEK	Lecture Dates	BIOL261 LECTURE TOPICS (Mon 2-3 pm E7BT5; Tues 2-3 E7BT2)	LAB SESSIONS (Tues 3-6, Thurs 9-12 or Friday 9-12 in E5A220)	RECOMMENDED READINGS FROM BENTO HARPER (2009) & IMPORTANT DATES
1	L1: 4 Aug L2: 5 Aug	Lec 1: The History of Life and the context of deep time Lec 2: Fossilisation and modes of preservation	Lab: Modes of preservation and information loss	Ch. 1, pp. 1-21. C 57-78.
2	L3: 11 Aug L4: 12 Aug	Lec 3: Precambrian fossil record Lec 4: Cambrian explosion	Lab: Cambrian Skeletospace	Ch. 8, pp. 183-203. Ch. 10, pp 241-257
3	L5: 18 Aug L6: 19 Aug	Lec 5: Sponges, corals, reefs Lec 6: Trilobites (Guest Lec: Patrick Smith)	Lab: Trilobites	Ch. 11, pp. 260-296 Ch. 14, pp.
4	L7: 25 Aug L8: 26 Aug	Lec 7: Early Molluscan Evolution (Guest Lec: Sarah Jacquet) Lec 8: Brachiopods	Discussion Topic: Lab: Brachiopods and community analysis	Discussion Topic to be handed in during this class Ch. 12, pp. 297-313. Ch. 13,
5	L9: 1 Sept L10: 2 Sept	Lec 9: Molluscs II (Guest Lec: Julieta Martinelli) Lec10: Functional morphology	Lab: Bivalves and functional morphology	Ch. 13, pp. 332-340. Ch. 6 150-159.
6	L11: 8 Sept L12: 9 Sept	Lec 11: Basal Deuterostomes Lec 12: Echinoderms	Lab: Echinoderms	Ch. 15, pp. 389-393. Ch.15, p
7	L13: 15 Sept L14: 16 Sept	Lecs 13 & 14: Mass extinctions (Guest Lecs: Dr Luke Strotz)	Lab: Mass extinctions (a do-it-yourself web based assignment due in the first prac after the break)	Major Assignment to be handed in by 5.00 pr 19th Ch. 7, pp. 162-182.
MID-SEMESTER BREAK (20th September - 7th October)				
8	L15: 6 Oct L16: 7 Oct	Lec15: NO LECTURE (Labour Day Public Holiday) Lec16: Foraminifera	Lab: Forams and palaeoenvironmental reconstruction	Week 7 prac to be handed in during this weel class Ch 9, pp. 203-216.
9	L17: 13 Oct L18: 14 Oct	Lec 17: Graptolites Lec 18: Biostratigraphy (Guest Lec: Marissa Betts)	Lab: Graptolites and biostratigraphy	Ch. 15, pp. 409-42 Ch. 2, pp. 22-41.
10	L19: 13 Oct L20: 14 Oct	Lec 19: Trace Fossils Lec 20: Fossil record of plants	Lab: Trace Fossils and Palaeoethnology	Ch. 19, pp. 509-532 Ch. 18, p

11	L21: 27 Oct L22: 28 Oct	Lec 21: Early Vertebrate Evolution Lec 22: Milestones in vertebrate evolution	Lab: Canowindra fish taxonomy and ecology	Ch. 16, pp. 427-478.
VOLUNTARY FIELD EXCURSION (25th October)				
12	L23: 3 Nov L24: 4 Nov	Lec 23: Dinosaurs I Lec 24: Dinosaurs II	Lab: Dinosaur trackways	Ch. 17, pp. 453-462. Ch. 518-519; 520-521.
13	L25: 10 Nov L26: 11 Nov	Lec 25: The evolution of Homo Lec 26: Revision / wrap-up	Lab: No practical lab session this week - private revision for final exam	Ch. 17, pp. 471-478; Revision for the Final E

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

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

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

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

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

Attendance requirements

Workload. Since BIOL261 is a 3 cp unit, you are expected to spend ~9 hours per week (including face-to-face teaching time) working on this unit for the duration of the semester. Please note that Macquarie University defines a semester as being 15 weeks in duration – 13 weeks of face-to-face teaching, plus the two week mid-semester break.

Lectures. BIOL261 has 2 x 1 hour lectures per week. Lecture 1 is on each Monday from 2.00 pm in E7BT2 and Lecture 2 is on each Tuesday from 2.00 pm in E7BT5. See the separate Unit Schedule on iLearn for the topics to be covered each week. It is in your best interests to attend the lectures each week. Students who regularly attend lectures tend to perform better than those students who attend lectures infrequently. Formal lectures will focus on a broad range of palaeontological concepts and topics including important 'core' topics (e.g. biostratigraphy and functional morphology) as well as some exciting new avenues of palaeontological research (see Unit Schedule). Lectures will be available via iLearn.

Weekly Laboratory sessions. All internal students **MUST** attend one 3 hour Lab each week. Labs are available on Tuesday (15.00–18.00), Thursday (9.00-12.00) or Friday (9.00-12.00) each week. Lab sessions are held in Building E5A room 220. Palaeontology is essentially a hands-on subject and each week's laboratory session will provide you with the opportunity to come into contact with a broad range of fossil groups that will reinforce the terminology and concepts outlined in the lectures. You are not expected to memorise genus and species names of particular fossils, but you are expected to become familiar with their morphology, function and applications.

Introductory slides for each laboratory session will be available on the BIOL261 iLearn page. Worksheets to be completed during each laboratory session will also be available on ILearn. All students are required to bring copies these worksheets with them to each Lab. These worksheets contain specific tasks that need to be completed and relevant background information that will assist in completing each laboratory session. The online lab quizzes will be based on the tasks set out in these worksheets.

On-campus sessions. Externals students will complete Lab sessions in two week-end blocks. For logistic reasons some Labs may have to alter slightly to conform with a weekend schedule when labs are held back to back over the weekend. On campus session I will be held 30-31 August and On-campus session II will be scheduled for October 18-19.

Note: laboratory sessions begin in week 1!

3.4 Assignment submission

Turnitin. In order to tackle the issue of student plagiarism, Macquarie University uses an online anti-plagiarism detection tool called *Turnitin*. This program works by comparing each student's work with the work of other students and material found online. More information on this anti-plagiarism software is available at: http://www.lib.mq.edu.au/infoethics/plag.html. As part of the submission requirements for the Discussion Topic and Major Assignment, all BIOL261 students

must also submit their work to *Turnitin*. Note that this is in addition to submitting a hard or digital copy of each assignment in the usual way. **Students who do not submit their assignments to *Turnitin* will not have their work marked until they do so.** You can upload you work to Turnitin through the BIOL261 iLearn website.

Lab quizzes (30%). You are expected to complete all laboratory sessions in the time allotted each week. For internal schedules, the online quiz will be opened at 4.00 pm on Friday each week and you will have 6 days to complete the quiz. You can only complete the quiz in the week of the class. External students will have a separate schedule to access the quizzes. It will not be possible for internal students to complete the external quiz sessions (and vice versa).

Discussion topic (10%). The group discussion/debate for the Discussion Topic will take place prior to your laboratory session in **WEEK 4**. **All internal students are expected to attend and participate in the group discussion/debate.** External students will complete the Discussion Topic at the 1st on-campus session. Your written response to the questions asked for the Discussion Topic must also be submitted in class at this time with a signed Faculty of Science assignment cover sheet attached. Don't hand your Discussion Topic in at the Science Centre.

Major assignment (20%). The Major Assignment must be submitted on (or before) **FRIDAY 19th SEPTEMBER** by 5.00 pm. This is the last Friday before the mid-semester break and only gives you 7 weeks to complete the Major Assignment. Therefore, I strongly suggest that you choose the Major Assignment topic you want to complete as soon as possible. Ideally, you should have started reading the relevant core papers for your chosen topic and started mapping out your first draft by Week 5.

The Major Assignment must be placed in the appropriately labeled box in the Faculty of Science Centre on the ground floor of E7A. Do not give them to me or slip them under my door! All assignments must be accompanied with a Faculty of Science cover sheet with your signature.

3.5 Extensions and penalties

If you require an extension to complete any work for this unit please discuss this with me as soon as possible. Unless accompanied by a doctor's certificate (or my direct approval) late assignments will be penalised at the rate of 5% per day.

3.6 Returning assessment tasks

Marks for the online lab quizzes will be released at the end of each week after the quiz has closed off. Correct answers for each quiz will be available on iLearn at a later date. The Discussion Topic is aimed to be returned to students a week after submission and the Major Assignment within 4-5 weeks of submission.

4. EXCURSION and RESOURCES

4.1 Voluntary Excursion

Field Excursion. A **voluntary** one day field excursion to examine fossiliferous Permian sequences in the Lower Hunter Valley will be held on **SATURDAY 25th OCTOBER**. The aim of the excursion is to provide each student with the opportunity to examine and collect fossils in the field, to explore how fossils are used to reconstruct palaeoenvironments and provide relative dates on sedimentary successions. Students will also have the opportunity to collect their own fossil material. More details will be provided at a later date

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://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.

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:

Assessment tasks

- Discussion topic
- online lab quizzes
- Major Assignment

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:

Assessment tasks

- Discussion topic
- online lab quizzes
- Major Assignment

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

- 1. Use fossils to interpret and reconstruct the history of life on Earth.
- 2. Identify the major morphological features of important invertebrate and vertebrate groups preserved in the fossil record.
- 3. Describe the significant evolutionary trends displayed by important animal and plant groups preserved in the fossil record.
- 4. Use fossils to solve basic biological, ecological, environmental and geological problems.

Assessment tasks

- Discussion topic
- 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

- 1. Use fossils to interpret and reconstruct the history of life on Earth.
- 3. Describe the significant evolutionary trends displayed by important animal and plant groups preserved in the fossil record.
- 4. Use fossils to solve basic biological, ecological, environmental and geological problems.
- 5. Undertake basic studies and interpretations of biostratigraphy, functional morphology, palaeoenvironmental reconstruction and palaeoclimatic interpretation.

Assessment tasks

- Discussion topic
- online lab quizzes
- Major Assignment
- 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

- 1. Use fossils to interpret and reconstruct the history of life on Earth.
- 5. Undertake basic studies and interpretations of biostratigraphy, functional morphology, palaeoenvironmental reconstruction and palaeoclimatic interpretation.

Assessment tasks

- Discussion topic
- online lab quizzes
- Major Assignment
- Final Exam

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

- 5. Undertake basic studies and interpretations of biostratigraphy, functional morphology, palaeoenvironmental reconstruction and palaeoclimatic interpretation.

Assessment tasks

- Discussion topic
- online lab quizzes
- Major Assignment

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

- 6. Use both verbal and written communication techniques to present your own ideas, analyses and interpretations of scientific evidence presented in the primary scientific literature.

Assessment tasks

- Discussion topic
- online lab quizzes
- Major Assignment

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:

Assessment tasks

- online lab quizzes
- Major Assignment

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 task

- Discussion topic