



Course Outline

BIOS1101

Evolutionary and Functional Biology

School of BEES

Faculty of Science

T2, 2020

1. Staff

Position	Name	Email & contact details	Consultation times and locations
Course Convenor	Stephen Bonser	Level 4 Biological Sciences building s.bonser@unsw.edu.au (though please use the course email) BIOS1101@unsw.edu.au	By appointment
Course Convenor	Teagan Gale	Rm 132 Samuels Building, t.gale@unsw.edu.au BIOS1101@unsw.edu.au	By appointment
Lecturers	S. Bonser M. Archer R. Bonduriansky T. Gale H. Bates	BIOS1101@unsw.edu.au	
Tutors & Supervisors	T. Gale V. Sim S. Ushiana	Online in practicals	

2. Course information

Units of credit: 6UOC

Pre-requisite(s): None

Teaching times and locations:

Summary of course structure			
Component	Hours Per Week	Time	Day
Lectures	3		
Lecture 1	1	Online	
Lecture 2	1	Online	
Lecture 3	1	Online	
Practical	3		
Option 1	3 (1hr Live)	2-3pm	Monday
Option 2	3 (1hr Live)	12-1pm	Tuesday
Option 3	3 (1hr Live)	2-3pm	Tuesday
Option 4	3 (1hr Live)	12-1pm	Wednesday
Option 5	3 (1hr Live)	2-3pm	Wednesday
Option 6	3 (1hr Live)	12-1pm	Thursday
Option 7	3 (1hr Live)	2-3pm	Thursday
Option 8	3 (1hr Live)	12-1pm	Friday

2.1 Course summary

This course examines the evolutionary history of life on earth from origins to humans and the relationship between environment, adaptation and function. Animal and plant physiology are covered with an emphasis placed on adaptation, identification, form and function in the Australian context.

2.2 Course aims

This course provides the basic information (assumed evolutionary and functional biology knowledge) for higher level courses in the Biological Sciences.

The aims of the course are:

- To engender an appreciation of the processes and causes of evolution.
- To stimulate an appreciation of the spectacular diversity of living organisms on the planet; a diversity underpinned by a surprising degree of unity.
- To provide students with a strong understanding of foundation level animal and plant physiology (form and function)
- To identify patterns of structure, organisation, development and reproduction in higher level organisms.
- To provide students with a strong repertoire of (foundation level) applied practical biological skills (for example, classification, identification of form and function, experimental design) required for future studies in higher level biological science subjects.

2.3 Course learning outcomes (CLO)

At the successful completion of this course you (the student) should be able to:

1. Explain the concept of evolution and the evolutionary processes responsible for the past and present diversity of life on Earth using evidence from the fossil record and living world.
2. Identify and classify living organisms into higher order evolutionary groupings.
3. Relate plant and animal anatomy, physiology and reproduction to function, adaptation and environment.
4. Demonstrate proficiency in fundamental biological laboratory skills (biological drawing and inferring scientific observations) through first-hand scientific investigations.
5. Gather, analyse and interpret data from first-hand scientific investigations to draw valid conclusions.

2.4 Relationship between course and program learning outcomes and assessments

Course Learning Outcome (CLO)	Program Learning Outcome (PLO)	Related Tasks & Assessment
CLO 1	<ul style="list-style-type: none"> Apply a working knowledge of fundamental scientific principles, methods of investigation, and an appreciation for objectivity and precision. Develop the habit of seeking and recognising relationships between phenomena, principles, theories, conceptual frameworks and problems. Demonstrate an understanding of the significance of science and technology in modern society. 	<ul style="list-style-type: none"> Evolution lectures Practicals Evolution and Natural selection Quiz Practical exam Final exam
CLO 2	<ul style="list-style-type: none"> Demonstrate confidence and skill in approaching problems and in treating qualitative data. Develop the habit of seeking and recognising relationships between phenomena, principles, theories, conceptual frameworks and problems. 	<ul style="list-style-type: none"> Practicals Practical exam Video Assessment Final Exam
CLO 3	<ul style="list-style-type: none"> Develop the habit of seeking and recognising relationships between phenomena, principles, theories, conceptual frameworks and problems. 	<ul style="list-style-type: none"> Physiology lectures Practicals Video Assessment Demon Assessment Practical exam Final exam
CLO 4	<ul style="list-style-type: none"> Apply a working knowledge of fundamental scientific principles, methods of investigation, and an appreciation for objectivity and precision. Demonstrate confidence and skill in approaching problems and in treating both qualitative and quantitative data. Apply curiosity, imagination, and speculation to solving problems, constructing hypotheses, and designing experiments. 	<ul style="list-style-type: none"> Physiology lectures Practicals Video Assessment Demon Assessment Practical exam Final exam
CLO 5	<ul style="list-style-type: none"> Apply a working knowledge of fundamental scientific principles, methods of investigation, and an appreciation for objectivity and precision. Demonstrate confidence and skill in approaching problems and in treating both qualitative and quantitative data. Develop the habit of seeking and recognising relationships between phenomena, principles, theories, conceptual frameworks and problems. Develop the ability and disposition to think logically and communicate clearly by written and oral means. Apply curiosity, imagination, and speculation to solving problems, constructing hypotheses, and designing experiments. 	<ul style="list-style-type: none"> Practicals Practical assessments Practical exam

3. Strategies and approaches to learning

3.1 Learning and teaching activities

BIOS1101 has two major course streams: lectures and practicals

Lectures and practicals run independently of each other. While these streams reinforce concepts, they are not designed to duplicate each other. Throughout the course, the streams will share overarching themes – each associated with a module of the syllabus. The syllabus covers three major themes (modules): 1. evolution and diversity, 2. animal form and function and 3. plant form and function.

Lectures:

Lectures cover the theoretical content, which is assessed in the final exam. There are three lectures per week. These lectures are not live and are pre-recorded. Lectures serve to cover the basic concepts of evolutionary and functional biology. Lecturers are usually active in research and have well-established reputations in the fields in which they teach. At UNSW, the people who teach you biology have made significant contributions to your area of study.

Practicals:

Practicals are designed to provide students with foundation-level applied practical skills. These skills are required for higher level biological science courses. It is important to be aware that some practicals relate to specific lectures, while others stand alone. The practical component is assessed through related assessments and a final practical exam.

The practical component of this course is designed to provide an introduction to evolutionary and functional biology. The aim of each practical is to teach you basic hands on skills required for second- and third-year biological courses.

The practical sequence relates broadly to that of the lectures. In such a short time frame it is not possible for all the material discussed in the lectures to be covered in the practicals. Select material is covered in the practicals to optimise your practical skills. In this course you will learn the practical skills of classification, identification form and function, biological drawing, and experimental design.

Practicals are divided into three parts which are designed to be completed sequentially.

- Part A: Online activities. Located under the “practicals” toggle on Moodle (~1hr)
- Part B: Worksheet. Also located under the “practicals” toggle on Moodle (~1hr)
- Part C: Online small group discussion with a demonstrator for 1 hour. You must have completed Parts A and B prior to Part C. This discussion will go over your answers to the worksheet. Students will need to share their answers and participate in discussions. Attendance is compulsory.

3.2 Expectations of students

Lectures

We do not check to make sure you watch the lectures weekly. We need to make sure that we cater in our lecturing for the range of differences in background knowledge of first year students. So, the lectures will aim to encourage students with little or no background in biology. Material in lectures may not be covered anywhere else, so you are strongly encouraged to watch all your lectures.

Practicals

Attendance at practicals

The practical aspect of biology is so important that participation in practical classes is a fundamental requirement for the award of a pass. There is one practical per week. Practicals are compulsory as they are all associated with assessment tasks. You can only attend the practical in which you are enrolled. Should you be unable to attend your practical class for any reason, you should contact Teagan Gale BIOS1101@unsw.edu.au to arrange to sit an alternate class (which must take place in the same week). All make-up practicals must be approved. For unavoidable absences from practical classes that cannot be made up at an alternate time, you must apply for Special Consideration. Please refer to Moodle for information on how to apply for Special Consideration.

If, due to sickness or some equally compelling reason, you must miss a practical the first thing you should do is contact Teagan Gale as soon as possible. One day of sickness does not grant an automatic one-week extension. If your absence is on the day of a test or examination, a zero mark will be recorded unless a medical certificate covering that day is submitted to special consideration. If your certified absence is from a test or examination, you must be prepared to do an equivalent assessment in subsequent weeks. Like all rules, these may not fit every situation. If you have a problem that is not covered, please ask Teagan Gale or e-mail BIOS1101@unsw.edu.au. Most problems are easily solved with timely notice.

Your behaviour during the online practicals or any live Q&A sessions is expected to be the same as if the classes were in person. Disruption of practicals by swearing or other inappropriate behaviour, constitutes academic misconduct and we must deal with those of you who continue to cause problems. **Do not forget to turn your mobile phones off during practicals.**

Where to go for help

You should always check for course information provided on Moodle. Please check this first and constantly check for updates on changes to times for drop-in sessions, upcoming assessment tasks and when they are due.

Academic matters

The first contact for help with course work is a demonstrator (i.e. the person who is present at one of the practical sessions). Consult the demonstrator if you have any difficulty with the subject material. Outside of class time all BIOS110 enquires should be directed to BIOS1101@unsw.edu.au.

4. Course schedule and structure

Evolutionary and Functional Biology encompasses three major themes as modules and will be presented in an integrated fashion. The modules provide the framework of the course. Please refer to your course timetable on Moodle for the lecture and practical schedule.

Module 1- Evolution and diversity

Lectures:

- L1. What is Evolution and Functional Biology (S. Bonser)
- L2. Origins and Early Evolution of Life (M. Archer)
- L3. Specialised Cells-1 (M. Archer)
- L4. Specialised Cells-2 (M. Archer)
- L5. Feeding and Digestion (M. Archer)
- L6. Evolution and the Evidence for it (M. Archer)
- L7. Human Evolution (M. Archer)
- L8. Humans Conserving Evolution (M. Archer)
- L9. Adaptation and behaviour (R. Bonduriansky)

Practicals/tutorials:

Evolution and natural Selection
Animal Diversity, Unity and Classification

Module 2- Animal form and function

(relate animal anatomy, physiology and reproduction to function adaptation and the environment)

Lectures:

- L10. Digestion and Nutrition (H. Bates)
- L11. Circulation and Gas Exchange (H. Bates)
- L12. Animal Reproduction (R. Bonduriansky)
- L13. Animal Nervous Systems (T. Gale)
- L14. Animal Hormones (R. Bonduriansky)

Practicals/tutorials:

Gross Morphology 1: Frog anatomy and morphology
Gross Morphology 2: Rat anatomy and morphology

Module 3- Plant form and function

(relate plant anatomy, physiology and reproduction to function adaptation and the environment)

Lectures:

- L15. Plants- Life on land (S. Bonser)
- L16. Reproduction 1 (S. Bonser)
- L17. Reproduction 2 (S. Bonser)
- L18. Internal Architecture of Plants (S. Bonser)
- L19. Plasticity (S. Bonser)
- L20. Plant Communication (S. Bonser)
- L21. Transport 1 (S. Bonser)
- L22. Transport 2 (S. Bonser)
- L23. Exam revision (S. Bonser)

Practicals/tutorials:

Diversity in Botany,
Reproduction in Flowering Plants
Plant Plasticity

Course Schedule

WEEK	LECTURE 1	LECTURE 2	LECTURE 3	PRACTICAL	ASSESSMENTS
1 1-5 June	L1. What is evolutionary and functional biology S. Bonser	L2. Origins and early evolution of life M. Archer	L3. Specialised cells 1 (independent cells) M. Archer	P1 Evolution and Natural Selection	
2 8-12 June	NO LECTURE Public holiday	L4. Specialised cells 2 (tissue) M. Archer	L5. Feeding and digestion in animals M. Archer	NO PRACTICAL Online Tutorial What is a theory? Scientific method	
3 15-19 June	L6. Evolution and evidence for it M. Archer	L7. The evolution of humans M. Archer	L8. Humans conserving evolution M. Archer	P2 Animal Diversity, Unity and classification	Evolution and natural selection quiz 5%
4 22-26 June	L9. Adaptation and behaviour R. Bonduriansky	L10. Digestion and nutrition H. Bates	L11. Circulation and gas exchange H. Bates	P3 Gross Morphology 1: Morphology and Anatomy of Anura (Frogs)	
5 29 June- 3 July	L12. Animal Reproduction R. Bonduriansky	L13. Animal Nervous systems T. Gale	L14. Animal Hormones R. Bonduriansky	P4 Gross Morphology 2: Morphology and Anatomy of the Rat and histology	
6 6-10 July	NO LECTURE	NO LECTURE	NO LECTURE	NO PRACTICAL	Plant and Animal Group Videos 15%
7 13-17 July	L15. Plants life on land S. Bonser	L16. Reproduction 1 S. Bonser	L17. Reproduction 2 S. Bonser	P5 Plant Diversity and form	
8 20-24 July	L18. Plant internal architecture S. Bonser	L19. Plasticity S. Bonser	L20. Plant communication S. Bonser	P6 Reproduction in Flowering Plants	Designing a Demon 15%
9 27- 31 July	L21. Transport 1 S. Bonser	L22. Transport 2 S. Bonser	L23. Final exam overview S. Bonser	P7 Plant Plasticity	
10 3-7 Aug	Practical Exam	Practical Exam	Practical Exam	PRACTICAL EXAM	Practical Exam 15%

5. Assessment

5.1 Assessment tasks

Assessment	Task	Knowledge & abilities assessed	Assessment criteria	% of total mark	Date of		Feedback		
					Release	Submission	WHO	WHEN	HOW
Practical assessments (35%)	1. Evolution and natural selection quiz	Knowledge of evolutionary processes, evidence for evolution, how evolutionary relationships are inferred	Moodle quiz. Students must select the correct answers	5	Week 1	Week 3 On Moodle	Moodle	Week 3	Marks
	3. Group video	Knowledge of research topic. Creativity, science communication skills, research skills, ability to work as a member of a group.	Video produced to help peers' study for the practical exam. Quality and presentation of information conveyed. Creativity, ability to work as a member of a team.	15	Week 1	Week 6 See Moodle for submission instructions	Practical demonstrator	Week 8	Marks and comments
	4. Designing a Demon	Research skills, writing skills. Biological drawing	Ability to follow strict scientific guidelines and produce a high standard biological drawing, references, accuracy of answers and overall conclusions	15	Week 5	Week 8 In class	Practical demonstrator	Week 10	Marks, comments
Practical exam (15%)	Practical Exam	Identification and understanding of practical material.	Exam testing the student's abilities to identify and or explain form and function of practical material	15	Week 10	Moodle	Moodle	Study week	Marks, Moodle
Final exam (50%)	Theory Exam (100 multiple choice question). Set in final exam period.	Knowledge and understanding of content and concepts from lectures	Exam testing students understanding of content and concepts covered in lectures.	50		Exam period			Final Grade

Practical assessments

Practical assessments account for 35% of your final BIOS1101 grade. These lab assessments take on different forms drawing assessments, group videos and Moodle quizzes. For further breakdown and details see the timetable in the cover of this manual and the practical notes throughout the manual. In addition to these direct assessments, ALL material and information provided in the practicals can be assessed in the final practical exam. To prepare for the practical exam it is important that all students make accurate and understandable notes to study from during each practical.

Practical exam

The practical exam takes place in the final practical session of the trimester (Week 10) and is worth 15% of your final BIOS1101 grade. This exam covers material from ALL practicals and can come from any aspect of any practical class. You must attend this practical exam during the time specified to you in the weeks prior to the exam.

Final exam

The final exam is organized by the UNSW examinations branch and will be held during the examination period (August). You are expected to be available throughout this period. Only in exceptional circumstances will alternatives be offered – booking your holiday to start before the end of the exam period is not an exceptional circumstance. The final exam will be of multiple-choice format and will be of 2 hours duration. It will cover all of the material covered in the lectures (and associated readings). Final exam papers are not released, which includes past papers. Example questions are available on Moodle as lecture quizzes. These quizzes are designed to help you study for the exam.

If necessary, a supplementary exam may be allowed on medical or compassionate grounds. A claim for special consideration must be lodged on myUNSW and medical certificates and/or any other official documentation must be given to UNSW Student Central as soon as possible. UNSW Student Central will subsequently inform the Biosciences student office of any special consideration notifications received.

5.3 Submission of assessment tasks

Please see Moodle for detailed instructions for assessment submission. Videos are to be submitted via YouTube link via course email – see Moodle for detailed instructions closer to submission date.

If, due to sickness or some equally compelling reason, you must miss a practical the first thing you should do is contact Teagan Gale via the course email in the same week as the missed day in order to see if it is possible to slot you in with another class. One day of sickness does not grant an automatic one-week extension. If your absence is on the day of a test or examination, a zero mark will be recorded unless a medical certificate covering that day is submitted via special consideration. If your certified absence is from a test or examination, you must be prepared to do an equivalent assessment in subsequent weeks. Like all rules, these may not fit every situation. If you have a problem that is not covered, please ask Teagan Gale or e-mail Bios1101@unsw.edu.au. Most problems are easily solved with timely notice.

Assignments submitted after the due date will be penalised at the rate of 10% per day unless accompanied by a medical certificate and special consideration application (**lodged via myUNSW**). All outstanding assignments must be handed in by the end of Week 10. Work will only be accepted after this date if accompanied by a special consideration application. (**This is School 'policy'.**)

6. Academic integrity, referencing and plagiarism

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.

Further information about referencing styles can be located at <https://student.unsw.edu.au/referencing>

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage.¹ At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you do not follow these rules, plagiarism may be detected in your work.

Further information about academic integrity and **plagiarism** can be located at:

- The *Current Students* site <https://student.unsw.edu.au/plagiarism>, and
- The *ELISE* training site <http://subjectguides.library.unsw.edu.au/elise>

The *Conduct and Integrity Unit* provides further resources to assist you to understand your conduct obligations as a student: <https://student.unsw.edu.au/conduct>

¹ International Center for Academic Integrity, 'The Fundamental Values of Academic Integrity', T. Fishman (ed), Clemson University, 2013.

7. Readings and resources

Course practicals

Worksheets available on Moodle course page.

Textbooks

Required Text: Urry, Lisa A., et al. Campbell Biology: Australian and New Zealand Edition eBook, P.Ed Australia, 2017. ProQuest Ebook Central. Available on the Library website, you can also download PDFs of chapters.

The textbook is an essential part of this subject, and you may be examined on those portions set as readings for lectures and practical purposes. For assessment, material from lectures, practicals and directed readings may be the subject of examination questions. The textbook (indeed any textbook) will cover far more material than can be included in a single course. We direct your attention to parts of the textbook - but encourage you to develop your interest by exploring the textbook more widely.

A biological dictionary can be very useful. The campus book shop usually has several different dictionaries. Highly recommended is Henderson's Dictionary of Biology 14th Edition (2008) Pearson: Benjamin Cummings.

Other materials

Other useful materials, including additional readings, recommended internet sites, and societies, will be provided via the Moodle page

8. Administrative matters

School information	There is a wealth of information for students on the School's web site http://www.bees.unsw.edu.au . Depending on your interest, you can find out about courses, future postgraduate opportunities and even the research areas of your lecturers.
Occupational Health and Safety	Information on relevant Occupational Health and Safety policies and can be found on the following website: http://www.bees.unsw.edu.au/health-and-safety UNSW OHS Home page: http://safety.unsw.edu.au
Equity and Diversity	Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course Convenor prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (9385 4734 or http://www.studentequity.unsw.edu.au or https://www.edi.unsw.edu.au/students/disability/equitable-learning-services Issues to be discussed may include access to materials, signers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

	<p>Language Difficulties</p> <p>Biology deals with many concepts which must be explained in words. This requires careful and accurate use of English. In addition, biology, as with any discipline, has its own specialist language which you will need to learn. In some cases, particular words have a specialised use in biology which is different from their everyday meaning.</p> <p>The textbook contains an extensive glossary, and most terms are explained when first introduced. In addition, lecturers and demonstrating staff will explain new terms. We do not expect you to pick up this new vocabulary instantly, but eventually it will become second nature.</p> <p>If you do not have a good command of English, you may find the course difficult. UNSW provides a range of opportunities for you to improve your language skills – if you are having difficulty please contact the Learning Centre</p>
<p>Special consideration</p>	<p>Students who believe that their performance, either during the session or in the end of session exams, may have been affected by illness or other circumstances may apply for special consideration. Applications can be made for compulsory class absences such as (practicals), assessments tasks, and final examinations. Students must make a formal application for Special Consideration for the course/s affected as soon as practicable after the problem occurs and within three working days of the assessment to which it refers.</p> <p>Students should consult the “Special Consideration” section of the UNSW current students’ website for further information https://student.unsw.edu.au/special-consideration.</p> <p><u>HOW TO APPLY FOR SPECIAL CONSIDERATION</u></p> <p>Applications must be made via Online Services in myUNSW. You must obtain and attach Third Party documentation before submitting the application. Failure to do so will result in the application being rejected. Log into myUNSW and go to My Student Profile tab > My Student Services channel > Online Services > Special Consideration. After applying online, students must also verify supporting their documentation by submitting to UNSW Student Central:</p> <ul style="list-style-type: none"> • Originals or certified copies of your supporting documentation (Student Central can certify your original documents), and • A completed Professional Authority form. <p>The supporting documentation must be submitted to Student Central for verification within three working days of the assessment or the period covered by the supporting documentation. Applications which are not verified will be rejected. Students will be contacted via the online special consideration system as to the outcome of their application. Students will be notified via their official university email once an outcome has been recorded.</p> <p>SUPPLEMENTARY EXAMINATIONS:</p> <p>The University does not give deferred examinations. However, further assessment exams may be given to those students who were absent from the final exams through illness or misadventure. Special Consideration applications for final examinations and in-session tests will only be considered after the final examination period when lists of students sitting supplementary exams/tests for each course are determined at School Assessment Review Group Meetings.</p>

	<p>Students will be notified via the online special consideration system as to the outcome of their application. It is the responsibility of all students to regularly consult their official student email accounts and myUNSW to ascertain whether or not they have been granted further assessment.</p> <p>For Term 2 2020, BEES Supplementary Exams will be scheduled in August/ September 2020.</p> <p>Further assessment exams will be offered on this day ONLY and failure to sit for the appropriate exam may result in an overall failure for the course. Further assessment will NOT be offered on any alternative dates.</p>		
	<p>In all cases you should first try to resolve any issues with the course convenor.</p> <p>If this is unsatisfactory, you should contact the School Student Ethics Officer (A/Prof Stephen Bonser, s.bonser@unsw.edu.au) or the Deputy Head of School (A/Prof Scott Mooney s.mooney@unsw.edu.au) who is the School's Grievance Officer and Designated Officer under the UNSW Plagiarism Procedure.</p> <p>UNSW has formal policies about the resolution of complaints that are available online for review (see https://student.unsw.edu.au/complaints).</p>		
<p>Student complaint procedure</p>	<p>School contact</p>	<p>Faculty Contact</p>	<p>University contact</p>
	<p>Dr S Mooney Deputy Head of School (Undergraduate Programs) s.mooney@unsw.edu.au Tel: 9385 8063</p>	<p>Dr Chris Tisdell Associate Dean (Education) cct@unsw.edu.au Tel: 9385 6792</p> <p>or</p> <p>Dr S Mooney Associate Dean (Undergraduate Programs) s.mooney@unsw.edu.au Tel: 9385 8063</p>	<p>Student Administration in the Office of the Pro-Vice Chancellor (Students). clare.jones@unsw.edu.au Tel: 9385 3087</p> <p>University Counselling and Psychological Services3 Tel: 9385 5418 counselling@unsw.edu.au</p>

9. Additional support for students

- The *Current Students Gateway*: <https://student.unsw.edu.au>
- Academic Skills and Support: <https://student.unsw.edu.au/skills>
- Student Wellbeing, Health and Safety: student.unsw.edu.au/wellbeing
- Disability Support Services: <https://student.unsw.edu.au/disability>
- UNSW IT Service Centre: <http://www.it.unsw.edu.au/students>