



Course Outline

BIOS3171

Evolution

Biological, Earth and Environmental Sciences

Faculty of Science

T3, 2022

1. Staff

Position	Name	Email	Consultation times and locations
Course Convenor and Lecturer	Russell Bonduriansky	r.bonduriansky@unsw.edu.au	By appointment, Biological Sciences room 5101
Lecturer	Michael Kasumovic	m.kasumovic@unsw.edu.au	By appointment, Biological Sciences room 5105

2. Course information

Units of credit: 6

Pre-requisite(s): Evolutionary and Physiological Ecology - BIOS2011

Teaching times and locations (please see the Course Schedule for additional details):

Lectures: posted online to do on your own time before the tutorial each week

Tutorials: Tuesdays 2 – 5 pm, Matthews Building room 231

(for overseas students: Zoom link and password available on Moodle)

Quizzes: On Moodle (available after the Tutorial until Sunday night, weeks 1-5, 7-10)

<http://timetable.unsw.edu.au/2021/BIOS3171.html>

2.1 Course summary

BIOS3171 Evolution is a project-based course covering the core concepts, research techniques and skills of modern evolutionary biology. This course is designed to help students learn key evolutionary ideas, and to develop their study design, analysis, and scientific communication skills. Students have the opportunity to learn hands-on by making observations and collecting biological data for their independent projects. Students will analyse their data, write a research paper, and create a short video to communicate their findings.

2.2 Course aims

- To prepare students for independent research in Honours and HDR programs
- To help students to gain a deeper understanding of the core concepts of evolutionary biology
- To help students learn evolutionary research techniques and improve their analysis skills
- To help students improve their scientific communication skills

2.3 Course learning outcomes (CLO)

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

1. Be able to apply key concepts of evolutionary biology and design empirical studies to address evolutionary research questions
2. Be able to collect and analyse biological data using established techniques of evolutionary research, including statistical analysis and valid interpretation of results
3. Be able to write a scientific paper
4. Be able to communicate research findings through a video targeted at a broad audience

3. Strategies and approaches to learning

3.1 Learning and teaching activities

Lectures will cover foundational concepts, and tutorials will involve activities designed to help students understand concepts and develop key skills (i.e., study design, data analysis, writing) needed to carry out the independent project. Each week, students will also do a Moodle quiz designed to help students gauge their understanding of the material.

Students will also submit the Evolutionary Film Criticism Assignment. This assessment is designed to help students understand and apply evolutionary concepts.

Independent Research Project:

The major project assignment is designed to help students deepen their understanding of evolutionary ideas, and to learn to design research studies, collect, analyse and interpret scientific data. This project is also designed to help students improve their scientific communication skills.

Option 1: Students will design a research study, collect data, carry out a statistical analysis, and write an empirical research paper on their results. Students will also make a research video outlining their study, findings and interpretation.

Option 2: Students will write a grant application that proposes a research study. Students who choose this option will not be required to collect and analyse empirical data. Students will make a research video explaining their research question and proposed methodology.

Students who are in the Sydney area are expected to choose Option 1. Option 2 is available to students who are overseas, or otherwise unable to collect data for their projects.

3.2 Expectations of students

Students will be expected to work through online lectures on their own time prior to the tutorial each week, attend all tutorials, and to participate in class discussions. Students will also be expected to submit their assessments on time according to the instructions provided. Lectures will be posted on Moodle, and students are responsible for working through these lectures prior to the tutorial each week. Lectures contain questions that students are encouraged to work through to test their understanding. Tutorials will be face-to-face (but students who are enrolled from overseas can participate via Zoom). Students will also be expected to complete a Moodle quiz each week. Quizzes will test students' understanding of topics covered in lectures and online classes. During classes and in lectures, students will learn skills and concepts that will be essential in carrying out their independent projects. Students are expected to devote time outside of weekly classes to their assessments. Students should discuss their research topic and plan with their instructors.

4. Course schedule and structure

Week [Date/Session]	Topic [Module]	Activity [Learning opportunity]	Related CLO
Week 1	Environment, selection and drift	Class discussion, Quiz	1
Week 2	Adaptation and development	Class discussion, Quiz	1
Week 3	Sexual selection Examples of evolutionary studies	Class discussion, Quiz DUE: Evolutionary Film Criticism	1
Week 4	Genetics and heredity Designing experiments	DUE: Research Paper outline	1
Week 5	Evolution of sex Scientific writing and citation	Class discussion, Quiz	1, 2, 3, 4
Week 6 (Flexiweek)	Fieldtrip to Smith's Lake Field Research Station	Data collection for research projects	1, 2, 3
Week 7	Life history and ageing Analysing data and presenting results	Class discussion, Quiz	4
Week 8	Human evolution Trade-offs and parent-offspring conflict	Class discussion, Quiz DUE: Research Video	1, 2, 3, 4
Week 9	Parent-offspring conflict Video peer-marking	Class discussion, Quiz	1
Week 10	Applying evolutionary ideas Thinking about the future: Honours, PhD, and research careers	Class discussion, Quiz DUE: Research Paper	1

5. Assessment

5.1 Assessment tasks

Assessment task	Length	Weight	Mark	Due date (normally before midnight on due date)
Assessment 1: Evolutionary Film Criticism	1 page	10%	20	Week 3
Assessment 2: Research Video	5-min video	10%	20	Week 8
Assessment 3: Research Paper and 1-page project outline	Proposal: 1 page Paper: 2,500 words	60%	10 (outline) + 50 (paper) = 60	Outline due week 4 Paper due week 10
Assessment 4: Weekly quizzes	10 questions per quiz	20% total	9 x 10 = 90	Weeks 1, 2, 3, 4, 5, 7, 8, 9, 10

Further information

UNSW grading system: <https://student.unsw.edu.au/grades>

UNSW assessment policy: <https://student.unsw.edu.au/assessment>

5.2 Assessment criteria and standards

Evolutionary Film Criticism

Assessment criteria	Marks
Original and interesting critique of an appropriate film (not fantasy)	5
Demonstrates good understanding of at least one evolutionary principle	10
Well written (engaging, logical structure, correct grammar and spelling)	5
TOTAL	20

Research Video

Assessment criteria	Marks
Content <ul style="list-style-type: none"> - Presents the research question in an interesting, logical manner. - Explains technical concepts in an easy-to-understand manner, without being condescending - Provides enough background that the audience understands why the question is important. - Evidence of your own ideas and/or critical thought - Demonstrates a clear understanding of the processes by which evolution works. 	10
Video style <ul style="list-style-type: none"> - Avoids jargon - Enthusiasm. Sounds interested in the topic and holds the audience's interest - Eye contact with the audience (if applicable) 	5
Quality of video <ul style="list-style-type: none"> - Appropriate length - Images are used properly - Any text isn't obtrusive or offensive, and if used, easily read - Does not use excessive animation or have spelling mistakes - Visually appealing layout without the feeling of being hurried 	5
TOTAL	20

Option 1: Research paper (based on data that you obtained)

Assessment criteria	Marks
Outline (1-page) Outlines a clear research question, explains why the question is interesting and important, proposes a logical methodology, written in good scientific English	10
Title - Appropriate title that summarizes the aims of the project	1
Abstract - Clear summary of the research question (and why it's interesting), research methods, findings and conclusion	4
Introduction - Identifies a gap in knowledge and outlines a clear research question related to evolution - Explains why this research is necessary and how it will improve our understanding of evolution - Briefly outlines a logical methodology to address the research question	10
Methods - Clearly outlines how the data were collected - Clearly explains how the data were analysed - Explains why the methods are appropriate to answer the research question	10
Results - Clearly describes what was found - Reports statistical results (if any) correctly	10
Discussion - Links results back to the research question posed in the Introduction: what <i>answer</i> does your research suggest? - Places findings in broader context of previous research - Clearly connects the findings to <i>evolutionary principles</i> - Clearly outlines the conclusions from the research	10
References - Cites at least 6 (preferably 10) relevant <i>scientific</i> references (not Wikipedia, etc) to support factual statements in your paper - Uses referencing and in-text citations correctly, and in an appropriate and consistent format (e.g. the format used by the journal <i>Evolution</i>)	5
TOTAL	60

Option 2: Research grant application

Assessment criteria	Marks
Outline (1-page) Outlines a clear research question, explains why the question is interesting and important, proposes a suitable methodology, written in good scientific English	10
Title - Appropriate title that summarizes the aims of the project	1
Background - A coherent outline of existing knowledge showing what is <u>not</u> yet known and why it's important to fill this gap in knowledge	9
Research aims (or question) - Articulates clear research aims/question - Clear outline of predictions (if any) from theory	10
Methods - Clearly outlines how the data would be collected - Suggests how the data would be analysed - Explains why the methods are appropriate to answer the research question	10
Anticipated outcomes and interpretation - Describes possible outcomes from the research, and explains how these outcomes will be interpreted (linking back to your predictions, if any)	10
Benefit and importance - Links results back to the research question posed in the Introduction - Clearly connects the findings to <i>evolutionary principles</i> - Explains why the proposed research is important (e.g., what valuable knowledge it will provide, or what practical outcomes it might lead to)	5
References - Cites at least 6 (preferably 10) relevant <i>scientific</i> references (not Wikipedia, etc) to support factual statements in your paper - Uses referencing and in-text citations correctly, and in an appropriate and consistent format (e.g. the format used by the journal <i>Evolution</i>)	5
TOTAL	60

Weekly quizzes (9 quizzes, Weeks 1-5, 7-10, on Moodle)

Correct answers to questions.

5.3 Submission of assessment tasks

Evolutionary Film Criticism assignment: submit through Turnitin.

Research Project Outline: submit through Turnitin.

Research Paper: submit through Turnitin.

Research Video: upload to YouTube (make sure that your video is designated as “Public” or “Unlisted”) and submit the link through Turnitin.

5.4. Feedback on assessment

Written feedback will be provided through Turnitin on the Evolutionary Film Criticism assignment, the 1-page project outline, and the Research Paper. Rubrics showing the breakdown of marks will also be provided to students via Turnitin.

The Research Video will be marked by your peers and lecturers, and feedback will be provided during class and in written form. The rubric will also be returned to students with their marks.

6. Academic integrity, referencing and plagiarism

Referencing is a way of acknowledging the sources of information that you use to research and write your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Using other people's work without properly citing the sources is a serious academic transgression called *plagiarism*. Most cases of plagiarism result from a lack of understanding of when and how to cite references, so please make sure that you understand the citation and referencing conventions of scientific writing.

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. Not following these rules can result in plagiarism. When plagiarism is detected in student work, marks will be deducted. Students who engage in serious or repeated plagiarism will fail the course, and will be reported to the University administration.

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/presenting>

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>.

Students will be expected to use the referencing style of the journal *Evolution*.

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

7. Readings and resources

Required and recommended readings will be provided on Moodle. The textbook *Evolution* 4th edition (D. Futuyama and M. Kirkpatrick) is recommended (but not required) as a resource. This textbook is available from the UNSW bookshop.

8. Administrative matters

<p>School information</p>	<p>School website: http://www.bees.unsw.edu.au/</p> <p>Questions regarding courses, enrolment, programs etc. Web Forms Enquire Now</p> <p>Director, Teaching & Learning: A/Prof. Stephen Bonser</p> <p>School Student Integrity Advisers (SSIA): A/Prof. Stephen Bonser or Prof. Alistair Poore</p> <p>Head of School: Prof. Alistair Poore</p>
<p>Occupational Health and Safety</p>	<p>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</p> <p>UNSW OHS Home page: http://safety.unsw.edu.au/</p>
<p>Equity and Diversity</p>	<p>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/).</p> <p>Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.</p>
<p>Student complaint procedure</p>	<p>http://student.unsw.edu.au/complaints</p> <p>School contact</p> <p>A/Prof. Scott Mooney</p> <p>Faculty contact</p> <p>A/Prof Chris Tisdell, Associate Dean (Education) cct@unsw.edu.au, Tel: 9385 6792</p> <p>University contact</p> <p>Student Conduct and Appeals Officer (SCAO) within the Office of the Pro-Vice-Chancellor (Students) and Registrar. Email studentcomplaints@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/academic-skills>
- Student Wellbeing, Health and Safety: <https://student.unsw.edu.au/wellbeing>
- Disability Support Services: <https://student.unsw.edu.au/disability-services>
- UNSW IT Service Centre: <https://www.it.unsw.edu.au/students/index.html>

BIOS3171 Outline at a Glance

Tutorials: Tuesdays 2 - 5pm Matthews 231 (overseas students can participate via Zoom)
Lectures: Online, on your own time, prior to the tutorial each week
Quizzes: On Moodle, available from after the Tutorial to Sunday night each week

Note: Students are required to attend all tutorials, and to work through the lectures prior to the tutorial each week. Attendance will be taken. There will be a quiz each week. Tutorials involve interactive, problem-based, and “flipped classroom” learning activities. Data for the Research Paper will be collected by the students during the fieldtrip to Smith’s Lake FRS. Skills required to analyse the data and write the Research Paper will be taught during weekly tutorials. Resources provided on-line cannot not replace these learning activities. Students who miss tutorials (without a valid excuse) are therefore unlikely to pass the course.

Week 1: Tutorial-Basic concepts

Week 2: Tutorial-Basic concepts

Week 3: Tutorial-Examples of evolutionary studies
DUE: Evolutionary film criticism

Week 4: Tutorial-Designing experiments

Week 5: Tutorial-Scientific writing and citation

Week 6: Fieldtrip to Smith’s Lake Field Research Station: data collection for research projects

Week 7: Tutorial-Analysing data and presenting results

Week 8: Tutorial-Human evolution and life history
DUE: Research Video

Week 9: Tutorial-Parent-offspring conflict
Video peer-marking

Week 10: Tutorial-Applying evolutionary ideas
Thinking about the future: Honours, PhD, research careers
DUE: Research Paper

Assessments:

Evolutionary film criticism (1-page):	10%
Research Video:	10%
Research Paper (including 1-page outline):	60%
Quizzes (weeks 1-5, 7-10 combined):	20%
	<hr/>
	100%