

Ngā Whakamārama | Course Information - 2025

BIOL354 Animal Ecophysiology

0.125 EFTS 15 Points
Semester 2

Whakamahuki | Description

This course examines the physiological adaptations that permit survival of animals in the diverse range of environments they inhabit, and the regulatory mechanisms that ensure homeostasis in the face of environmental fluctuation. Aspects of human impacts on the environment and their consequences for the animals therein are also addressed (e.g. pollutants, climate change). The approach taken is comparative, drawing on both vertebrate and invertebrate examples. A major emphasis of the course is on practical learning, with laboratories that provide hands-on experience with a number of physiological techniques, in a diverse group of animals, exposed to a wide range of environmental variables.

Goals of the Course

To develop an understanding of the physiological mechanisms that enable animals to withstand the various and complex challenges posed by nature and humans.

Pūkenga Lecturers /	Tari Office	E-mail
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Robyn Hetem is the *Kairuruku Akoranga* / Course Co-ordinator, and should be your first point of contact for any queries regarding the course.

Wātaka / Timetable

See the [Course Information System](#) for timetable.
All lectures start on the hour.

Lectures

Lectures start week 1 of semester 2

Two lectures per week, during Term 3 and Term 4.

Please check course information for lectures times and locations.

Students should note that in the Science Faculty the average student is responsible for approximately 4.5 hours of additional study for each hour of lecture at the 300-level.

Laboratories

Please note that labs start in the first week of the semester.

Students will allocate themselves or will be allocated to one of two laboratory streams (allocation will open approximately a week before term begins, so if you have a preference get in quick!).

The laboratory is in **West 519 Biology Lab**. Four-hour slots are allocated for labs, but some sessions will be shorter and are intended as dedicated time for data analysis and report write up.

Aromatawai | Assessment

Final exam 30%

Laboratory reports 30% (10% per lab report)

Laboratory competency 10%

Project report 20%

Project presentation 10%

Āhuatanga Taura | Graduate Profile

This course will provide students with an opportunity to develop these UC Graduate Attributes (GP) and Kaupapa (K) within the [graduate profile](#):

- GP1 Critically competent in a core academic discipline
- GP2 Employable, innovative and enterprising
 - K1 Working effectively and professionally with diverse communities
 - K2 Communication
 - K3 Analytical, critical thinking and problem solving in diverse contexts
- GP3 Bicultural competence and confidence
 - K1 A process of self-reflection on the nature of 'knowledge' and 'norms'
 - K3 Traditional and contemporary realities of Māori society e.g. tikanga and kawa, te reo Māori
- GP5 Globally aware
 - K2 Understanding the global nature of the one's discipline

Hua Akoranga | Learning Outcomes

As a student in this course, I will develop

critical competence in the core academic discipline:

- * Understand the challenges to animal life posed by different environments
(assessment task: exam, laboratory and project reports)
Related graduate attributes: GP1, GP2, GP5
- * Understand the physiological mechanisms animals have utilised to cope with challenges
(assessment task: exam, laboratory and project reports)
Related graduate attributes: GP1, GP2, GP5
- * Understand the ‘real-world’ value of studying ecophysiology as a discipline, including bicultural and multicultural perspectives.
(assessment task: laboratory and project reports)
Related graduate attributes: GP1, GP2, GP3, GP5
- * Expand practical experience of basic experimental techniques in animal physiology
(assessment task: laboratory competency and reports, project report)
Related graduate attributes: GP1, GP2, GP5
- * Develop key skills in experimental design, physiological methodology, data analysis, data interpretation, literature assimilation, scientific writing and communication
(assessment task: laboratory and project reports and presentation)
Related graduate attributes: GP1, GP2, GP5

Principles are presented in lectures and developed in laboratories. These learning outcomes will be assessed via the end-of-course exam, laboratory reports and competencies and a project report and presentation.

Pūkenga Ngaio | Transferable Skills

As a student in this course, I will develop the following skills:

- * Practical operation of physiological equipment. *Measuring physiological parameters is a critical tool in exercise, research, and hospital laboratories.*
Related graduate attributes: GP1, GP2
- * Analysing data. *Condensing raw data into meaningful values and then assessing the resulting trends is a key skill in a number of vocations, both within science and in other areas.*
Related graduate attributes: GP1, GP2
- * Synthesising information. *Assimilating presented knowledge, integrating this with your own research, then communicating it effectively in your own words is a valuable skill applicable across almost a range of fields.*
Related graduate attributes: GP1, GP2, GP5
- * Writing reports. *Using scientific databases to find literature, integrating with your own findings, and then effectively communicating this in a written form is absolutely critical in science.*
Related graduate attributes: GP1, GP2
- * Working as a team. *The labs and project will require you to work in teams, a task that will involve effective organization, problem-solving, communication, co-ordination, and interpersonal attributes.*
Related graduate attributes: GP2, GP3, GP5

Textbooks

The recommended text is Wilmer *et al.*, but there are a number of supplementary texts that will provide suitable background information to particular lectures and/or the course in general. These texts are all on restricted library loan. For some lectures, primary literature (*i.e.* journal articles) may form the basis of the recommended reading. Readings will be made available through Learn.

Recommended text:

Willmer, Stone and Johnston, [Environmental Physiology of Animals](#), Blackwell, 2005
[available as an electronic resource through the UC library].

Supplementary texts:

Hill, Cavanaugh, Anderson, [Animal Physiology](#). Sinauer Associates, Oxford, 2022
Randall, Burggren, French, [Eckert's Animal Physiology: mechanisms and adaptations](#), Freeman & Co., 2001
Schmidt-Nielsen, [Animal Physiology: adaptation and environment](#), Cambridge University Press, 1997
Withers, [Comparative Animal Physiology](#), Saunders College Publishing, 1992.

Electronic Distribution of Course Material

Information about the course, including the course handout, notices, summaries of lectures and other details will be placed on Learn.

Students with Disabilities:

Students with disabilities should speak with someone at the Equity & Disability Service, if you have not already done so (<https://www.canterbury.ac.nz/equity-disability/>). Please speak to the course coordinator at least one week before any course activity for which you have a special requirement.

Prerequisites BIOL250

Course content / *Hōtaka*

	Date	Lecturer	Lecture topics	Labs
	TERM 3			
1	16 Jul	Robyn	Introduction	Allometry lab (3hr)
2	17 Jul	Robyn	Acclimation & adaptation	
3	23 Jul	Robyn	Metabolism & the thermal environment	Allometry (analysis)
4	24 Jul	Robyn	Measuring metabolic rate	
5	30 Jul	Robyn	Ectotherms vs ectotherms	Countercurrent lab (3hr)
6	31 Jul	Robyn	Ectotherms in cold	
7	6 Aug	Robyn	Endotherms in cold	Countercurrent (analysis)
8	7 Aug	Robyn	Adaptations to heat	
9	13 Aug	Robyn	Physiology of movement	Nitrogen lab (3hr)
10	14 Aug	Robyn	Physiology of migration	
11	20 Aug	Robyn	High elevation	Nitrogen (analysis)
12	21 Aug	Robyn	Diving	
	TERM 4			
13	10 Sep	Kenyon	Digestive physiology	Project planning (2hr)
14	11 Sep	Kenyon	Digestive physiology	
15	17 Sep	Kenyon	Reproductive physiology	Data collection (3hr)
16	18 Sep	Kenyon	Reproductive physiology	
17	24 Sep	Kenyon	Reproductive physiology	Data collection (3hr)
18	25 Sep	Kenyon	Reproductive physiology	
19	1 Oct	Stevie	Stress physiology	Data analysis (2hr)
20	2 Oct	Stevie	Stress physiology	
21	8 Oct	Robyn	Responses to climate change	Presentations (2hr)
22	9 Oct	Robyn	Physiologist's toolbox	
23	15 Oct	Robyn	Conservation Physiology	
24	16 Oct	Robyn	Revision	

RULES, REGULATIONS, AND WHAT TO DO WHEN THINGS GO WRONG

[updated March 2023]

If in doubt: ASK! The course coordinator is happy to answer questions. All staff involved in the course are available for advice on specific issues.

What do I do if I have to miss a test/exam or if my performance was impaired?

In Biological Sciences, we require a satisfactory level of achievement in both the theoretical aspects of the discipline and in practical activities. **This means you must attend all class activities (labs, tutorials, fieldtrips)** and submit all items of assessment unless you have a very good reason not to (e.g. medical reasons) and if this has been approved by your course coordinator.

If you feel that **illness, injury, bereavement or other extenuating circumstances beyond your control** prevented you from completing a **test/exam** worth 10% or more of the total course assessment, or if these circumstances affected your performance in such assessments, you should apply for Special Consideration. Applications for Special Consideration should be submitted via the Special Consideration website <http://www.canterbury.ac.nz/study/special-consideration/> *within five working days* of the assessment or its due date. You should also notify the course coordinator. If you apply for Special Consideration because of medical reasons, you should visit a doctor within a reasonable timeframe (application form available on the website above or from the Student Health Centre).

The Special Consideration provisions are intended to assist students who have covered the work of a course but have been prevented by illness or other critical circumstances from demonstrating their mastery of the material or skills at the time of a test/exam – **they do not excuse you from doing the test/exam** within a reasonable time agreed with the course coordinator.

What do I do if I have to miss a quiz or assignment or if I need an extension?

You cannot apply for Special Consideration if you miss an assessment that is not a test/exam, such as a quiz, lab report, essay, literature review or other assignment, or if the test/exam is worth less than 10% or more of the total course assessment. If this happens or if you need an extension because of **illness, injury, bereavement or other extenuating circumstances beyond your control**, please contact the course coordinator and arrange an alternate activity and/or submission date. You should also do this if you have to miss a laboratory, tutorial or field trip.

What are other valid reasons to miss an assessment or mandatory course activity?

The Special Considerations policy (<https://www.canterbury.ac.nz/about/governance/ucpolicy/student/special-consideration-procedures-and-guidelines/>) outlines only a few kinds of activities that UC considers valid reasons for missing an assessment or mandatory course activity other than those outlined above. These include **involvement in international or national representative sport or cultural groups**. Holiday trips, birthday parties, weddings, work-related commitments etc. are not given special status in this University policy. Please contact your course coordinator to ask for an alternate activity and/or submission date if you are eligible.

Special Consideration for late discontinuation of a course

Students prevented by **extenuating circumstances** from completing the course after the final date for withdrawing, may apply for Special Consideration for late discontinuation of the course. Applications must be submitted via <http://www.canterbury.ac.nz/study/special-consideration/> no later than five working days after the examination period has finished.

Academic Integrity

It is the responsibility of each student to be familiar with the definitions, policies and procedures concerning academic misconduct/dishonest behaviour. Instances of academic misconduct will be dealt with in a serious and appropriate manner. Students should refer to: <https://www.canterbury.ac.nz/about/ako/academic-quality/academic-integrity/>

Plagiarism

It is essential that you are aware that plagiarism is considered a very serious offence by the academic community, the University and the School of Biological Sciences. Plagiarism is defined as taking content from another work or author and presenting it, without attribution, as if it is your own work. Content here includes text (sentences or major parts of sentences), display items (graphs and tables), and overall structure (the detailed sequence of ideas). Plagiarism includes:

- re-use of previous assignments (even if each individual sentence has been rephrased to say the same thing in different words, if the overall structure is re-used).
- copying of another student's work (with or without their consent).
- the unreferenced use of published material or material from the internet, e.g. cutting and pasting of paragraphs or pages into an essay.
- the generation of text using artificial intelligence technology without disclosure and when it is not intended to be part of an assignment.

For most pieces of in-term assessment you will be given information concerning the use of direct and indirect quotes from previously published work. If you have any doubt about the appropriate use of published material, please speak with an academic staff member. If you are unsure what plagiarism is, seek advice.

It is a School policy that courses will likely that you submit work electronically for subsequent analysis of originality using *Turnitin*. Students agree that by taking courses in BIOL, assessments may be submitted to Turnitin.com for textual similarity review. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Terms and Conditions of Use as posted on the Turnitin.com site.

Where do I hand in assignments and then collect them once marked?

All assignments should be submitted as directed by the course coordinator. Typically, this will be electronically via Learn for on-line grading and for analysis in *Turnitin*. If a hard copy is requested, assignments should be placed in the designated collection boxes in the foyer of the 2nd floor of the School of Biological Sciences (Julius von Haast building, at the top of the stairs). All assignments must be accompanied by a cover sheet signed by you stating that the submitted work is not plagiarised. Cover sheets are available on top of the collection boxes, or you can download one from the Biology website (<http://www.canterbury.ac.nz/media/documents/science-documents/assignment-coversheet.pdf>).

Marked assignments will be returned through Learn or, if in hard copy, can be collected from the School of Biological Sciences reception, unless directed otherwise by the course coordinator. Teaching staff will endeavour to return work as soon as possible, and should contact you if there are likely to be any delays that will prevent return within the maximum 4-week timeframe.

What if I can't get it finished in time?

Reports and assignments should be handed in on time. Extensions may be granted if you have a valid reason (see above). **If you require an extension, you should request one from the course coordinator** (or the lecturer responsible for marking the work), with as much notice as possible. Please do this BEFORE the deadline for the assignment. **If you have been given an extension and you have been asked to submit a hard-copy of your work, you should hand the work DIRECTLY to the course coordinator** (do not put it in the drop box as it may not be cleared after the due date).

If an extension has not been granted:

- work handed in within 1 hour of the deadline: penalty of up to 5 percentage points of the mark for the assignment (e.g., a mark of 75% might be reduced to 70%).
- work handed in 1 – 24 hours after the deadline: penalty of 10 percentage points of the mark for the assignment (e.g., a mark of 75% is reduced to 65%).
- work handed in 1 – 7 days after the deadline: penalty of 15 percentage points of the mark for the assignment (e.g., a mark of 75% is reduced to 60%).
- work handed in more than 7 days after the deadline will not be marked or earn credit.

What if I have written more than the word or page limit?

If there is a word limit on an assignment, it is usually there to stop you doing too much work and to encourage you to write succinctly. You can be up to 10% over without too much worry, but if the length increases beyond that your mark may suffer due to failure to follow the requirements. If you find yourself way over the word limit talk to the lecturer concerned about how to get your assignment to an acceptable length. Unless specifically advised that there is flexibility, you must adhere to the word limit indicated.

What if I fail part of the course?

In Biological Sciences, we require a satisfactory level of achievement in both the theoretical aspects of the discipline and in practical activities. This means you must attend all class activities and submit all items of assessment unless you have a very good reason not to (e.g. medical reasons). **A student must attain an average score of at least 40% for in-course assessments (e.g. assignments, reports, quizzes) and an average score of at least 40% in the exam and/or tests, AND score at least 50% overall for the course, to be awarded a passing grade. See the course outlines for clarification of the assessment items included in each category and ask the coordinator if you are still unsure.**

What's the best way to give feedback?

We welcome constructive feedback at all times – help us to make this a valuable course for you. We endeavour to remain approachable at all times. If you would rather give feedback anonymously, please use the online course survey or talk to lab demonstrators, or your class rep (who will all report back to the staff-student liaison committee that includes a representative from each of the undergraduate classes). Class representatives will be selected from each class at the start of course.

What's the best way to complain?

If you feel you have not been fairly treated during this course, please raise the issue with the lecturer or course coordinator in the first instance. Other avenues include your class rep., who can raise issues anonymously, or the UCSA education coordinator.

Grading

A+	90% or above
A	85 – 90
A-	80 – 84
B+	75 – 79
B	70 – 74

B-	65 – 69
C+	60 – 64
C	55 – 59
C-	50 – 54

A restricted pass (R) **may** be awarded to those who are close to a pass (i.e. an overall score of 48-49.9%) AND who have achieved at least a 40% overall score in both in-course assessment and tests/exams. If an R grade is awarded you gain credit for the course but **cannot continue into papers that require this course as a pre-requisite**. NB. The R grade is only available at 100 and 200 level - it cannot be awarded for third year papers.

Failing grades: D 40-49 E 0–39