

Course Information / *Ngā Whakamārama* - 2023

BIOL250 Principles of Animal Physiology

0.125 EFTS 15 Points
First Semester Feb 2023 – June 2023

Description / *Whakamahuki*

This is a broad-based, elementary course in animal physiology providing an introduction to principal physiological systems in animals, how they operate and how they are regulated. Topics include membrane transport, osmoregulation and excretion, nervous and muscle systems, respiration and cardiovascular physiology. The treatment is comparative, although human and mammalian physiology receives greatest emphasis. Selected examples from vertebrates and invertebrates are used to illustrate physiological principles.

The course is intended to provide a foundation for students following a range of biological interests, including ecology, behaviour, biochemistry, genetics and sports and health sciences. BIOL 250 leads on to third year courses in advanced physiology (BIOL 351 Cell Biology, BIOL 354 Animal Ecophysiology, BIOL 355 Neurons, Hormones and Behaviour).

Lecturers / <i>Pūkenga</i>	Office / Tari	E-mail
Elissa Cameron	Julius von Haast 220	elissa.cameron@canterbury.ac.nz
Robyn Hetem	Julius von Haast 235	robyn.hetem@canterbury.ac.nz
Ximena Nelson	Julius von Haast 437	ximena.nelson@canterbury.ac.nz
Deirdre Merry	Julius von Haast 239	deirdre.merry@canterbury.ac.nz

Elissa Cameron is the Course Co-ordinator / *Kairuruku Akoranga*, and should be your first point of contact for any queries regarding the course.

Timetable / Wātaka

Lectures

Semester 1, Terms 1 and 2: two lectures per week.

Please make sure to check the Course Information System for lecture times and locations.

Laboratories

Students will allocate themselves or will be allocated to one of three or four laboratory streams (allocation will open approximately a week before term begins, so if you have a preference get in quick!). Labs run every second week for the whole semester, starting in the third week (ie no labs in the first week).

Please make sure to check the Course Information System for laboratory times and location.

Assessment / Aromatawai

Laboratory competency assessment (10%)

These are to be completed within the lab, and checked off by the demonstrator or instructor before you leave.

Laboratory Reports (15%)

You will write up two of the laboratory sessions as full reports, one worth 5% and the next worth 10%.

Mid-course test (25%)

You will be examined for 2 hours on the material covered in the first set of lectures of the course. The test will take place one evening in the **first week of Term 2**.

Final examination (50%)

This will be a 2-hour exam held during the June examination period, and will cover all course content including the lecture material in the final set of lectures.

Goals of the Course

The aim of the course is to introduce students to the comparative physiology of selected systems, giving students an appreciation of how the parts of the body work, but in particular, how the individual parts fit together into a working animal.

Learning Outcomes / *Hua Akoranga*)

- Develop knowledge about the functions of organs and tissues in animals, including humans
- Have an appreciation of how the parts of the body are linked into a functioning whole
- Understand the principle of homeostasis and the methods used by the body to maintain this
- Have practical knowledge of physiological techniques
- Be able to write about physiological topics
- Develop understanding on real-world applications of animal physiology to other sciences and knowledge systems

Principles are presented in lectures and developed in laboratories. These learning outcomes will be assessed via the tests and laboratory exercises.

Transferable Skills / *Pūkenga Ngaio*

- Practical operation of a physiological data recording system. *The PowerLab system, or the equivalent, is a critical tool in almost all real world scenarios that involve the recording of physiological data (e.g. exercise, research, and hospital laboratories).*
- 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.*
- 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.*
- Applying fundamental knowledge to applied settings. *The laboratory competency assessment will test your fundamental understanding of processes and ask you to apply this to various scenarios, encouraging you to learn principles, rather than memorise information.*
- Working as a team. *Many labs will require you to work in teams, a task that will involve effective organization, problem-solving, communication, co-ordination, and interpersonal attributes.*

Course Content / *Hōtaka*

Note that this schedule may be subject to change

Lecture	Date	Lecturer	Topic	Labs
1	Mon 19 Feb	Elissa	Introduction, homeostasis	No laboratory in week one
2	Tues 20 Feb	Robyn	Membrane physiology	
3	Mon 26 Feb	Robyn	Water and solutes	
4	Tues 27 Feb	Robyn	Renal physiology	
5	Mon 4 March	Robyn	Renal physiology	Lab 2: Epithelial transport and ion homeostasis
6	Tues 5 March	Robyn	Acid Base Balance	
7	Mon 11 March	Ximena	Membranes, neurons and potentials	
8	Tues 12 March	Ximena	Synapses and the nervous system	
9	Mon 18 March	Ximena	How drugs affect us	Lab 3: Introduction to Powerlab
10	Tues 19 March	Ximena	Neural responses	
11	Mon 25 March	Ximena	Neural biases	
12	Tues 26 March	Elissa	Term 1 roundup	
	Easter Break			
13	Mon 22 April	Deirdre	Muscles	
14	Tues 23 April	Deirdre	Muscles	Lab 4: Muscle Physiology
15	Mon 29 April	Deirdre	Muscles	
16	Tues 30 April	Robyn	Respiratory physiology	
17	Mon 6 May	Robyn	Respiratory physiology	
18	Tues 7 May	Robyn	Respiratory physiology	Lab 5: Human Ventilation
19	Mon 13 May	Deirdre	Cardiovascular physiology	
20	Tues 14 May	Deirdre	Cardiovascular physiology	
21	Mon 20 May	Deirdre	Cardiovascular physiology	
22	Tues 21 May	Deirdre	Cardiovascular physiology	Lab 6: Human Diving Response
23	Mon 27 May	Deirdre	Cardiovascular physiology	
24	Tues 28 May	Elissa	Course review	

Laboratories illustrate principles covered in the lectures, introduce you to methods of computer data acquisition and analysis, and include both human and animal subjects.

Course Requirements

To pass the course a student must do satisfactory practical work in laboratory classes as well as performing satisfactorily in the mid-course test and the final examination. To satisfy the requirements of the course students must complete all items of assessment. Exceptions to this will only be made under circumstances described in the University Regulations. An aegrotat pass in BIOL 250 normally requires satisfactory performance in either the mid-course test or the final examination, and in at least half of the laboratory work.

Attendance at laboratories is a requirement of the course, and, to explain any absence, a medical certificate or other appropriate evidence must be provided to the laboratory instructor.

From time-to-time notices about the course will be sent via email. It is assumed that all members of the class regularly check their email accounts on the UC student system. Lecture notes and other course material may be placed on LEARN.

Prerequisites

BIOL111

Textbook / *Pukapuka Ako*

The *recommended* course text is:

Sherwood, L., Klandorf, H., & Yancey, P. 2013. *Animal Physiology: From Genes to Organisms* (2nd edition). Brooks/Cole, Belmont, CA.

The following books are also useful for some topics: "Biology" by Campbell, French and Mitchell; "Human Biology" by Silverthorne (3rd edition); "Eckert Animal Physiology" by Randall, Burggren and French (5th edition) or indeed any other Animal Physiology text. Copies of some of these and other useful resources can be borrowed from the Restricted Loan section of the library.

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 use of text generated 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 request 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

