

Te Kura Pūtaiao Koiora  
School of Biological Sciences

**Ngā Whakamārama | Course Information - 2023**

**BIOL274 Principles of Ecology (BIOL274-22S1 [C] and [D])**

0.125 EFTS, 15 points, Semester 1 [Jan 2023 version]

**Whakamahuki | Description**

This course provides a fundamental grounding in the main concepts in and applications of ecology, the study of relationships between organisms and their environment. The most important concepts in population, community, landscape and ecosystem ecology are covered. These are considered using examples from across marine, freshwater, forest, grassland, urban and production ecosystems, and with particular reference to the factors controlling the distribution of plants, animals and microbes in Aotearoa New Zealand, and their differences to other countries. There is a particular emphasis on the problems and issues affecting natural systems, and how ecological knowledge can be applied to achieve solutions. We will also recognise taonga species and consider Māori perspectives on cultural management of natural resources. Overall, this course provides a thorough overview for those wanting to compliment other environmental knowledge. It can be combined with BIOL275 Field Ecology practical course to provide a comprehensive platform for those wanting to undertake more advanced ecological study.

A basic understanding of biology is assumed, including knowledge of evolution, population genetics and basic ecology provided by BIOL112. It will be helpful if students also have knowledge of organismal diversity from BIOL113. It will also be helpful if students are actively acquiring statistical knowledge, for example, we generally expect you have taken STAT101 (or equivalent) in your first year, and likely be taking a 200 level data analysis course (BIOL209, GEOG205, or GEOG208). If this is not the case then discuss this with the course coordinator.

**Kairuruku Akoranga | Course Co-ordinator**

Prof Matthew Turnbull, Julius von Haast 222, ext 95153, [matthew.turnbull@canterbury.ac.nz](mailto:matthew.turnbull@canterbury.ac.nz)

**Ngā Pūkenga | Lecturers**

Prof Matthew Turnbull, Julius von Haast 222, ext 95153, [matthew.turnbull@canterbury.ac.nz](mailto:matthew.turnbull@canterbury.ac.nz)

Dr Sara Kross, teaching remotely, [sara.kross@canterbury.ac.nz](mailto:sara.kross@canterbury.ac.nz)

Prof Angus McIntosh, Julius von Haast 226, ext 95186, [angus.mcintosh@canterbury.ac.nz](mailto:angus.mcintosh@canterbury.ac.nz)

Dr Mads Thomsen, Julius von Haast 233, [mads.thomsen@canterbury.ac.nz](mailto:mads.thomsen@canterbury.ac.nz)

**Whāinga Mahi | Goals**

We aim to introduce the key principles of ecology including their relevance to the New Zealand and international contexts, and impart knowledge of their potential applications in management and conservation.

## Hua Akoranga me ngā Aromatawai | Intended Learning Outcomes and Assessment

*As a student in this course, I will develop the ability to:*

### Learning Outcomes

1. Apply the main concepts in population, community and ecosystem ecology to appropriate situations (*assessment: test and final exam*)

**Related Graduate Attributes and Kaupapa:** Critically competent in the core academic discipline, Globally aware.

2. Be able to discuss and interpret factors controlling the distribution and abundance of organisms at individual to global scales (*assessment: test and final exam; GP1*)

**Related Graduate Attributes and Kaupapa:** Critically competent in the core academic discipline, Employable, innovative and enterprising, Globally aware.

3. Describe the problems affecting ecosystems globally, and be able to discuss how ecological knowledge from a range of perspectives can be applied to achieve solutions (*assessment: quiz, test and final exam*)

**Related Graduate Attributes and Kaupapa:** Critically competent in the core academic discipline, Biculturally Competent and Confident (kaupapa 1,3,5,6), Employable, innovative and enterprising, Globally aware.

4. An understanding of biculturalism in Aotearoa New Zealand as it applies to native species as taonga and Māori cultural management of biological resources. (*assessment: quiz, test and final exam*).

**Related Graduate Attributes and Kaupapa:** Critically competent in the core academic discipline, Biculturally Competent and Confident (kaupapa 1,3,5,6), Employable, innovative and enterprising.

5. Synthesize scientific literature to provide appropriate background, context and interpretation for an ecological question (*assessment: test, final exam*)

**Related Graduate Attributes and Kaupapa:** Critically competent in the core academic discipline, Employable, innovative and enterprising.

### Pūkenga Ngaio | Transferable Skills

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

- Synthesis & interpretation of information. *Research findings will be discussed in lectures, and implementing this skill will be important in all course assessment. GP1*
- Formation of hypotheses & explanations. *Developing explanations for patterns and observations is important to developing an understanding of principle concepts. We will encourage this through discussions and feedback on test. GP1*

\*GP1, GP2, etc, refer to Graduate Profile attributes: (1) Critically competent in a core academic discipline of their degree; (2) employable, innovative and enterprising; (3) biculturally competent and confident; (4) engaged with the community; and (5) globally aware.

### Āhuatanga Tāura | Graduate Profile

Critically competent	Employable, innovative and enterprising	Biculturally competent and confident (BiCC)	Engaged with the community	Globally aware
Yes	Yes	Yes	-	Yes

## **Aromatawai | Assessment**

The course is conducted by lectures, tutorials, a mid-course test, and a final exam, as detailed below.

- 25% online (open-book) test on lectures 1-12 (Turnbull) to be completed in one hour, online at course Learn site in week 4 (PROVISIONAL DATE - 15 March, evening 7-8 pm).
- 25% online (open-book) test on lectures 13-24 (Kross) to be completed in one hour, online at course Learn site in week 7 (PROVISIONAL DATE - 26 April, evening 7-8 pm).
- 50% final exam covering lectures 25-48 (McIntosh & Thomsen lectures). Details of exact format will be provided in Term 2, but likely short essay type questions. Sat in person for on-campus (C) students and online for (D) students.

Note that Biology policy (see end of this Course Information for details) requires you to obtain a score of at least 40% in the online tests and final exam, AND get an overall mark of at least 50%, to pass the course.

## **Tuhinga | Textbook**

Smith, T. M & Smith L. S. (2015) Elements of Ecology, 9<sup>th</sup> (Global) Edition. Pearson Education Limited, Edinburgh Gate, England.

## **Ētahi atu tuhinga e whai take ana | Other useful readings**

Begon M, Howarth RW, Townsend CR (2014) Essentials of ecology, 4th edition. Blackwell. (Previous course textbook)

Dawson, J, Lucas, R (2000) Nature guide to the New Zealand forest. Godwit. (Field guide useful for field course).

## **Rauemio Ako | Course materials**

Additional information including course handouts and supplementary reading will be posted on Ako | Learn.

Please also note that we will be requesting that you submit written work in both hard copy (for grading) and in electronic form (for assessment of originality using *Turnitin*). Instructions will be given on how you do this via Learn.

## **Prerequisites/Notes**

Prerequisite course: BIOL112

Restricted course: BIOL 270 (ie students who have previously taken BIOL270 cannot take this course)

**Wātaka | Timetable**

Week	Date	Lect. no	Lecture Topic	Assessment
			<b>Matthew Turnbull: Introduction to ecology, environmental factors &amp; ecosystem processes</b>	
1	20 Feb	1	Physical environment I	
		2	Physical environment II (includes Māori understanding of microclimate*)	
		3	Adaptation to the environment I (incl. NZ plants and animals)	
		4	Adaptation to the environment II	
2	27 Feb	5	Adaptation to the environment III	
		6	Adaptation to the environment IV	
		7	Adaptation to the environment V	
		8	Adaptation to the environment VI	
3	6 March	9	Ecosystem energetics I	
		10	Ecosystem energetics II	
		11	Nutrient cycling in ecosystems I	
		12	Nutrient cycling in ecosystems II	
			<b>Sara Kross: Pop. ecology &amp; competition</b>	
4	13 March	13	Life histories: life tables	
		14	Life history strategies	
		15	Tradeoffs: cost of reproduction	<b>Online TEST (Turnbull lects) 7-8pm</b>
		16	Tradeoffs: offspring size/number	
5	20 March	17	Tradeoffs: parent-offspring conflict	
		18	Intra-specific competition	
		19	Dispersal: plants	
		20	Dispersal: animals	
6	27 March	21	Metapopulation dynamics	
		22	Mutualisms: pollination, dispersal	
		23	Pathogens	
		24	Interspecific competition	
			<b>Mid semester break</b>	
			<b>Angus McIntosh: Interactions &amp; food webs</b>	
7	24 Apr	25	Prey selection & foraging	
		26	Predator avoidance & the ecology of fear	
		27	Predator and prey populations	
		28	Trophic cascades & top-down/bottom-up control	<b>Online TEST (Kross lects) 7-8pm</b>
8	1 May	29	Herbivory & plant defences	
		30	Predator impacts on communities	
		31	Indirect effects & food webs	
		32	Food web stability (includes taonga spp & ecosystems*)	
9	8 May	33	Food chain length	
		34	Ecosystem function and biodiversity	
		35	Invaders	
		36	Invasions (includes colonisation*)	
			<b>Mads Thomsen: Community ecology</b>	
10	15 May	37	Community structure I	
		38	Community structure II	
		39	Factors affecting community structure I	
		40	Factors affecting community structure II	
11	23 May	41	Community dynamics	
		42	Landscape dynamics	
		43	Large scale patterns	
		44	Climate changes I	
12	29 May	45	Climate changes II	
		46	Production systems	
		47	Protected areas (includes Treaty of Waitangi rights*)	
		48	Cross-ecosystem ecology	
	5 June		Study week	
	12 – 24 June		Examination period (see exam timetable, released term 2, for exact date/time/place)	

\*Topics include BiCC materials

## Feedback from Course Surveys

On a 1-5 scale where 1 = worst and 5 = best (last surveyed in 2018)

Standard questions	2018 (n=53, 84%)
Q1 - The materials provided helped me to understand what was required to succeed in this course.	4.5
Q2 - The organisation of this course helped me learn.	4.5
Q3 - I found the workload was appropriate to the level of the course.	4.3
Q4 - I found the assessments appropriate for the course.	4.4
Q5 - Where I sought feedback on my assessments, I found it helpful.	4.3

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

[updated January 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.

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