School of Biological Sciences

Version 6 Aug (with topic name updates)

Course Information / *Ngā Whakamārama* - 2023

BIOL375
Freshwater Ecosystems

0.125 EFTS 15 Points
Semester 2

Description / *Whakamahuki*

This course provides a thorough grounding in the ecology of freshwater ecosystems, including lakes wetlands and rivers. It covers the most important concepts that underpin our understanding of these ecosystems, but given the imperilled plight of fresh waters around the world, there is a heavy emphasis on practical applications for solving current problems. A highlight of the course is a residential field course based at the University's Cass field station and visiting the West Coast. The field course hones practical skills in association with quantitative state-of-the-environment monitoring and team-based project work. Laboratory sessions prior to the trip develop basic physical and chemical sampling procedures, as well as macroinvertebrate identification, and are complemented by fish sampling and investigation of the wide range of aquatic systems. Moreover, by combining this practical expertise with detailed knowledge of how freshwater ecosystems work and the main approaches to managing them, students will be well placed for a diverse range of careers connected to freshwater ecosystems and the resources they provide.

Learning Outcomes / *Hua ako*

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

- Understand current topics in freshwater ecology and their application to management of freshwater ecosystems locally, nationally and internationally (*assessment: on-line quizzes*) GP1, 2 & 5
- Understand through experience the characteristics of freshwater ecosystems, the threats they face and the connections of people, including Māori, with those ecosystems. (*discussions on field trip*) GP3 & 4
- Develop practical skills including species identification, experimental design, data analysis (*assessment: identifications & interpretations; Research report*) GP1 & 2
- Improve scientific communication skills, including report writing and use of the literature (*assessment: Research report, non-assessed: field trip oral presentation*) GP 1 & 2
- Conduct field work safely (*field trip preparation and conducting field work for Research report*) GP 2

Transferable Skills / *Pūkenga Ngaio*

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

- Discovery, synthesis and interpretation of information. *Combining information from lectures, course readings, the literature, and field trip in discussions on the field trip and course assessment.* GP2
- Formation of hypotheses and explanations in the development of a research project. *The field trip will include discussions to develop hypotheses that can be tested in the field trip research.* GP2

- Conducting safe field work in hazardous outdoor environments. *Before the field trip a health & safety discussion will occur focusing on identifying, eliminating, mitigating or minimizing hazards*. GP2
- Knowledge of field sampling protocols for freshwaters, conducting water quality testing, and identification of benthic invertebrates and fish. *We will carry out a range of exercises to illustrate useful field methods; the field trip will assess identification skills.* GP1&2
- Data analysis and interpretation. *Initial analysis of data will occur on the field trip, and appropriate further analysis methods discussed for use in field trip reports.GP1&2*
- Writing a report in scientific format using text and graphs. *Initial discussion on the field trip, and sessions about style, good graph design will be conducted.* GP2
- Be aware of the nature of multiple cultures in Aotearoa New Zealand as it applies to freshwater native species as taonga and mahinga kia. *We will discuss the concept of taonga species and Māori perspectives on mahinga kia (freshwater food)*. GP3.

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.

Teaching team / *Kāhui ako*

Course co-ordinator: Prof Angus McIntosh, Julius von Haast 333,
angus.mcintosh@canterbury.ac.nz
Teachers
Assoc. Prof. Jonathan Tonkin, jonathan.tonkin@canterbury.ac.nz
Dr Tadeu Siqueira, tadeu.siqueira@canterbury.ac.nz
Dr Helen Warburton, helen.warburton@canterbury.ac.nz
Prof Shaun Ogilvie, shaun.ogilvie@canterbury.ac.nz
Course Technician: Kim Doherty, kim.doherty@canterbury.ac.nz

Course Structure & Timings

The first three weeks of the course consist of online exercises which are aimed at providing you with fundamental material to prepare you for the rest of the course. We then have 6 contact sessions (comprising lectures, tutorials & workshops – all called 'tutorials' in table below) followed by a **compulsory** field trip during the semester break at the end of Term 3. At the beginning of Term 4 we have two weeks on no formal class time for you to complete assessment associated with the field trip, followed by a further 6 contact sessions (see Table below).

The times and locations of lectures can be found in the course information system.

Assessment / *Aromatawai*

10% Field trip test (due online by 5 pm Friday 15 September 2023)
20% Quizzes (2 on-line quizzes – inc. multiple choice & short answer questions) due after each two-week section of course (see course summary below)
35% Research report on field trip research project (due 5pm Friday 22 September 2023)
35% Final exam during examinations period

See below for departmental policies on late work, illness, and work that exceeds the length limits.

Any application for an extension must be made in writing (generally by email) to the Course Co-ordinator and any granting of an extension will be made by email.

Field Trip

The field trip involves 4.5 days divided between Cass and Christchurch between Monday 2 September and Saturday 9 September according to the following preliminary schedule. The field trip is **compulsory and is a major in-term assessment**. To attend the field course you need to be capable of safely carrying out physical activities in the outdoors including walking in riverbeds and steep slopes, and we will be living in bunkroom style accommodation at the Cass Field Station with group-catered food. The schedule is subject to change depending on weather and the final logistics associated with class size.

Likely field trip schedule

The field trip involves 4.5 days divided between Cass and Christchurch.
Group 1 (in red) work 4, 5, 6, 8 and half day on 9 Sept. Group 2 (in blue) work 4, 6, 7, 8 and half day on 9 Sept.
Each group spends two days at Cass (one night) and two and half on campus.

	Mon 4 Sept	Tues 5 Sept	Wed 6 Sept	Thurs 7 Sept	Friday 8 Sept	Sat 9 Sept
Activities Group 1.	Biomonitoring	travel to Cass		0	Lab day	Symposium (half day)
	from campus	Fish/Ponds	Project field work	[day off]	on campus	on campus
		Project dev	then back to Chch			
Activities Group 2.	Biomonitoring	0	travel to Cass	Project field work	Lab day	Symposium (half day)
	from campus	[day off]	Fish/Pond	then back to Chc	on campus	on campus
			Project dev			
Meals/Accomm.	0	Dinner	Breakfast		0	0
		o/night @ Cass	Lunch			
			Dinner	Breakfast		
			o/night @ Cass	Lunch		

Useful texts

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

Harding, J.S., Mosley, P., Pearson, C. & Sorrell, B., editors. (2004). *Freshwaters of New Zealand*. New Zealand Limnological and Hydrological Societies, Christchurch. (This is available as a pdf – FREE from https://www.canterbury.ac.nz/science/schools/biological-sciences/research/ferg/outputs/ …scroll to bottom)

Jellyman, P. G., T. J. A. Davie, C. P. Pearson, and J. S. Harding. 2016. *Advances in New Zealand Freshwater Science*. New Zealand Hydrological Society and New Zealand Freshwater Sciences Society, Christchurch, New Zealand. See http://freshwater.science.org.nz or in the library.

Course Summary

Date	Topic	Topic	Assessment
17-21 Jul	*1 online*	Dimensions of freshwater ecosystems	
24-28 Jul	*2 online*	Introduction to water chemistry	
31 Jul – 4 Aug		What lives in freshwaters?	
	3 online	- microbes & plants	
	4 online	- invertebrates	
	5 online	- fish	
7 Aug	*1-5 tutorial*	Wrap of the above (AM)	
8	*6 tutorial*	Autotrophs & heterotrophs (AM)	
9	*7 tutorial*	Life histories (AM)	
14	*8 tutorial*	Māori values and perspectives on freshwater (SO)	
15	*9 tutorial*	Community assembly (TS)	
16	*10 tutorial*	Biomonitoring (TS)	**Quiz***
21-25 Aug	*online*	Research project planning & reading (online)	
		Mid-semester break: Field trip (see prelim schedule above)	
		Mon 2 September till Sat 9 September	
11-15 Sep	*online*	Field trip test and Research report	
15 Sep			**Field trip test due**
18- 22 Sep		Work on Research report	
22 Sep			**Research report due**
25 Sept	*11 tutorial*	Climate responses & threats (JT)	
26	*12 tutorial*	Waterscapes (JT)	
27	*13 tutorial*	Flow regimes (JT)	
2 Oct	*14 tutorial*	Population dynamics and fisheries (AM)	
3	*15 tutorial*	Food webs (AM)	
4	*16 tutorial*	Restoration & Conservation (TS)	**Quiz***

*** Online quiz** opens for 48 hours

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 text/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 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

END