

## **BIOL/BCHM253** **Cell Biology 1**

0.125 EFTS, 15 Points  
Terms 1 and 2, Semester 1

### ***Whakamahuki* / Description**

The course will cover membrane structure, principles of membrane transport and the electrical properties of membranes, intracellular compartments and protein sorting, principles of the cytoskeleton, and the cell cycle and apoptosis. The primary aim of the course is to discuss the principles of cell biology at the level of the individual cell. The topics covered will give students a comprehensive grounding in cells as single entities. This will prepare students for the 3rd year cell biology course that will consider cells at a more advanced level, looking at cells in their social context and how they interact with other cells.

As all cells operate using the same basic machinery, experimental work on cells from “simpler” organisms has revolutionised our understanding of human biology and disease. Studies on the control of the cell cycle in yeast, for example have taught us much about human cancer. The use of such model organisms, which also include the wild mustard *Arabidopsis*, nematode worms and mice, is crucial in biological research and examples of a key process in cell biology from these organisms will be included. The genomes of these organisms have been sequenced, thus we know the molecular make-up of these cells. Genetics and biochemistry can tell us how various parts function individually and a key task for cell biologists is to understand how all of these interact together to form a dynamic living entity.

### ***Āhuatanga Taura* / Graduate Profile**

This course will provide students with an opportunity to develop these UC Graduate Attributes ([www.canterbury.ac.nz/study/graduate-profile/students/what-are-the-graduate-attributes/](http://www.canterbury.ac.nz/study/graduate-profile/students/what-are-the-graduate-attributes/)):

- GP1 Critically competent in a core academic discipline.
- GP2 Employable, innovative and enterprising.
- GP3 Biculturally competent and confident: K3 Traditional and contemporary realities of Māori society; K5 Process of colonisation and globalisation.

## **Hua ako / Course learning outcomes and Aromatawai / Associated assessment**

*At the end of the course, students are expected to be able to:*

- Gain a greater appreciation of the internal workings of the cell (*assessment tasks: in term test and final exam*). GP1
- Appreciate the sophistication of mechanisms that have evolved to enable the workings of a cell, but at the same time be mindful that we still have much to discover (*assessment tasks: laboratory assignments and final exam*). GP1
- Become familiar with modern cell biology experimental techniques (*assessment tasks: laboratory assignments*). GP1 and GP2
- Understand the use of “model organisms” - appreciate how experimental findings made on seemingly “lower organisms” such as nematodes and yeast can lead to a better understanding of the complexity of human biology and disease (*assessment tasks: laboratory assignments, in-term test and final exam*). GP1 and GP3 (K3 and K5).
- Appreciate how research in cell biology leads to a better understanding of disease and an understanding of the factors that are pertinent with respect to Māori health and the impact of colonisation. GP1 and GP3 (K5)
- Gain an understanding of both the theory and the practice of cell biology which will make me attractive to potential employers (*assessment tasks: laboratory assignments, in-term test and final exam*). GP1 and GP2

### **Pūkenga ngaio / Transferable skills**

*The following skills are developed in this course:*

- Synthesise information. In everyday life and in many job situations you will be required to read information from different sources, generate your own understanding and develop your own viewpoint. *Your understanding of the topics covered in the course will be achieved by reading information obtained from lectures, labs and assigned readings from textbooks and papers. In lectures we will discuss recent research papers and this will develop your abilities to identify the essential elements of research outputs - you will use these skills in report writing.* GP1 and GP2
- Collect experimental data. Important for research and in governmental and nongovernmental organizations. *We will conduct research activities in the lab to provide both the real-world context for lectures and to develop hands-on skills in data collection.* GP1 and GP3
- Analyse data. Important for research, as well as in a number of private-sector organizations. *This skill will be further developed when we assist you to analyse the data we generate in the lab.* GP1 and GP3
- Write a report on findings. Clear written communication is essential for most professional careers. *We will provide you with guidelines on the elements of successful reports.* GP1 and GP3

### **Prerequisites**

BIOL111 and 15 pts of 100-level CHEM

Recommended preparation: 30 points of CHEM at 100-level

## 2019 Course Evaluation

(Scoring used - 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, 1 = strongly disagree)

Question 1 - The materials provided helped me to understand what was required to succeed in this course: **4.7**

Question 2 - The organisation of this course helped me learn: **4.54**

Question 3 - I found the workload was appropriate to the level of the course: **4.58**

Question 4 - I found the assessments throughout the semester appropriate for the course: **4.6**

Question 5 - When I sought feedback on my assessments, I found it helpful: **4.54**

Selected Comments: *“Have finished the course feeling like I’ve really built on my knowledge from first year cell biology”*; *“I’m looking forward to taking cell biology 2 next semester. Thank you for doing such a great job”*; *“Feedback was very good”*.

## *Aromatawai* / Assessment

Lab assignments	30%
In-Term Test (45 min)	18% on lectures 1-6; this will be held one evening in the fourth/fifth week of term 1, and at a time and location to be announced.
Final Exam (2 h)	52% on lectures 7-24; time and location to be announced.

## Electronic Distribution of Course Material

All course material will be distributed on Learn. This will include

- \* course notices
- \* lecture handouts that will be available before the lectures.
- \* PDFs of lectures
- \* audio recordings of lectures
- \* laboratory results

## Textbook

The course text is:

Alberts B *et al.* (2014) *Molecular Biology of the Cell*, 6th edition, Garland Science.

This is an **excellent** textbook on cell biology – it is clearly written, comprehensive and authoritative. It also has very good figures which will be used extensively to illustrate the PowerPoint lectures in the course. It covers all aspects of the course, and includes many topics that there will not be time to mention at all. It is also used in the third year course in cell biology, BIOL351. It is available in soft-back from the University Bookshop at about \$170.

If you are unable to purchase your own copy, new or second-hand, some copies of the text are available on 3 hour Restricted Loan. Copies of the 5th edition might also be available second-hand.

Lecturers in the course will give references for additional recommended reading (including references to journal articles).

## ***Pūkenga / Teaching staff***

### **Course Coordinator**

Ashley Garrill, room 634, School of Biological Sciences  
email: ashley.garrill@canterbury.ac.nz

### **Lecture contacts:**

Ashley Garrill, contact details as above

Vanessa Morris, room 635, School of Biological Sciences  
email: vanessa.morris@canterbury.ac.nz

Claudia Meisrimler, room 633, School of Biological Sciences  
email: Claudia.meisrimler@canterbury.ac.nz

Christoph Goebel, room 635, School of Biological Sciences  
Email: christoph.goebel@canterbury.ac.nz

### **Lab contacts:**

Ashley Garrill - contact details as above  
Reijel Gardiner, Biological Sciences building  
email: reijel.gardiner@canterbury.ac.nz

## ***Wātaka / Timetable***

### **Lectures**

There are 2 lectures per week for this course in terms 1 and 2. Currently, these are scheduled as follows, although this is possibly subject to late changes – these will be notified on My Timetable and Learn.

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	time	venue
lecture 1	Monday 10 - 11 am	E7
lecture 2	Wednesday 9 - 10 am	E5

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### ***Schedule***

1 - 6	Ashley Garrill	The Cytoskeleton
7 - 12	Vanessa Morris	Cell Signalling/The Cell Cycle
13 - 15	Christoph Goebel	Disease, Cell death
16 – 18	Claudia Meisrimler	TBC
19 - 24	Ashley Garrill	Organelles, Vesicle Transport, Membranes

## Laboratory classes

The labs will take place in term 2.

There are 3 different streams, running on Tuesday (2 streams (9 – 1 and 2 – 6)) and Friday (12 – 4), and prior to the labs starting you will need to allocate to one of these streams. (you'll be informed when you can do this which will be later in term 1). Should you not be able to come to a lab on a particular day, please contact Ashley to discuss whether you can attend the lab in a different stream. Depending on stream sizes, this may or may not be possible.

### *Schedule*

<i>Lab</i>	<i>Topic</i>	<i>Related lectures</i>
1	Microscopy	-----
2	Streaming in <i>Nitella</i>	Cytoskeleton
3	Water transport in onion cells	Membrane biochemistry
4	Cell cycle	Cell cycle
5a	Immunolabelling MTs	Cytoskeleton
5b	Observation of MTs from Lab 5	Cytoskeleton

### *Aromatawai / Laboratory Assessment*

Assessment for the labs will comprise open-book quizzes, each worth 6%. These will be posted onto Learn after the lab and will comprise a series of questions concerning the methods and results from the practical class. You will be expected to provide short answers for these questions.

Together these laboratory assessments contribute 30% to the overall mark for the course. Unless otherwise indicated, laboratory assessments are due by 5:00 pm, one week after the last experiment of any laboratory exercise. This means that if your lab stream is Tuesday afternoon, your assignments are due at 5 pm on Tuesdays, whereas for Friday students have their assignments due at 5 pm on Friday. Assessments should be submitted via Learn and should be checked with Turnitin.

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

[updated 3 April 2020]

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

### **What do I do if I have to miss something or if my performance was impaired?**

If you feel that **illness, injury, bereavement or other extenuating circumstances beyond your control** prevented you from completing an item of assessment 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 will also need to 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 assessment – they do not excuse you from doing the assessment within a reasonable time agreed with the course coordinator. You should expect to be required to submit additional work if you miss a major assignment (e.g. a field trip for which a major write-up is required).

You should also apply for Special Consideration if you are not be able to complete an assessment or attend a field trip because of **involvement in international or national representative sport or cultural groups**. Please review the Special Considerations policy, because very few kinds of activities will be eligible for such consideration (e.g. holiday trips, birthday parties etc. are not given special status in the University policy).

**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.

### **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 may 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 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), unless directed otherwise by the course coordinator. 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>). In addition, you may also be asked to submit your work electronically (via Learn) for analysis in *Turnitin*.

Marked assignments 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. **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 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.

### **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) 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