School of Physical and Chemical Sciences

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

General Course Information

BCHM281
Practical Biochemistry

0.1250 EFTS 15 Points
Second Semester 2025

Note this course starts in the first week of the second semester

Description
This laboratory course has been designed to introduce you to the practical skills necessary to carry out the synthesis and characterisation of chemical compounds, the measurement of properties associated with chemicals and their reactions, and the biochemical techniques used in enzyme purification and characterisation.

Prerequisites
1. CHEM111 and CHEM112 (BCHM112) or 2. CHEM212

Timetable
This course consists of 88 hours of laboratory sessions and associated lectures/classes. Each student **must attend all** the laboratory sessions each week for 11 weeks. An attendance register will be taken at each laboratory session.

Course lectures will take place during the first part of the laboratory session(s) each week. The room will be on the UC website/My Timetable.

At the beginning of each laboratory session a pre-lab talk will be given. This will cover any relevant theory, particular experimental difficulties, safety aspects, and any questions you might have about the experiment.

Some of the timetabled laboratory sessions (precise details to be advised) may take place in computer rooms to allow data analysis. Students are also encouraged to bring their own laptops with them to laboratory sessions whenever practicable and if useful to facilitate writing-up experiments. A limited number of computers are available for student use in the laboratory.

Students are required to have read the appropriate section of the Laboratory Manual and to have completed any work required before the start of each laboratory session.

Assessment
1. **All** laboratory sessions **must be attended**, and the prescribed laboratory exercises performed to a satisfactory standard; *this is an absolute course requirement*. An attendance register will be taken. **If a student misses a laboratory without reasonable excuse (see below) then they will automatically fail the course, regardless of any marks they may have accrued for other activities.**

2. Any absence from a class session must be satisfactorily explained e.g. by the production of a medical certificate (a copy must be emailed to Dr Tim Allison), or by providing evidence of the need to isolate due to public health orders. **To protect the health of staff and fellow students, it is imperative to not attend in the case of sickness. Students should contact Dr Tim Allison at the earliest opportunity to notify of reason(s) for non-attendance.** If a student accumulates many absences, remedies (which may include alternative activities) may be applied, to be determined on a case-by-case basis.

3. The course coordinator will advise any student whose laboratory performance is unsatisfactory and will also notify the Head of School.

4. The grade for this course will be determined as follows:

i.	Laboratory Work	60%
ii.	Reports	20%
iii.	Test	20%

5. In addition to these formally assessed items all students must display basic competence at chemical calculations by passing the calculations quiz on the course LEARN site. Multiple attempts at this online quiz are possible, but it must be completed satisfactorily for a student to pass the course. **Failure to pass this online quiz by the specified deadline will result in automatic failure of the course, regardless of any other marks obtained.**

6. Students must adhere to the laboratory rules as specified in the laboratory manual.

7. There will be no final examination in this course.

8. ***The following shall apply to all assessments in this course, except where a lecturer has specifically stated otherwise in written instructions for an assessment.***

   Generative AI Tools cannot be used for these assessments
   In these assessments, you are strictly prohibited from using generative artificial intelligence (AI) to generate any materials or content related to the assessment. This is because students are expected to solve problems and demonstrate knowledge and understanding without the assistance of AI. The use of AI-generated content is not permitted and may be considered a breach of academic integrity. Please ensure that all work submitted is the result of your own human knowledge, skills, and efforts.

Course Co-ordinator
Dr Tim Allison, timothy.allison@canterbury.ac.nz

E-mail is the preferred method of contact for queries about the course

Laboratory Supervisors
Dr Justine Cottam, Dr Nathan Alexander, Assoc. Prof. Steven Gieseg, Prof. Renwick Dobson.

Safety in the Laboratory

Safety glasses or goggles and laboratory coats must be always worn in the laboratory. If you normally wear prescription glasses, you must either wear protective goggles over them or they must have lenses of plastic or toughened glass and be fitted with side-protectors.

Purchasing Safety Glasses, Lab Coats, and Model Kits
To purchase approved safety glasses, lab coats or model kits go to:
https://www.canterbury.ac.nz/science/current-students/shop/

Lab Footwear
Suitable footwear must be always worn. For safety **reasons jandals, open sandals, high heels, and any open toe footwear are not acceptable**.

Laboratory Manual
The laboratory manual will be given out, free of charge, at the first laboratory session. It is also available as a PDF file on the course LEARN site.

Answer Sheets
Laboratory work will be written up on the answer sheets that will be provided to you in each lab session (also available on Learn), or in the lab manual. The answer sheets will be marked by the Demonstrators in the week following that in which the experiment was performed. **The answer sheets must be handed-in for marking, to the container labelled BCHM281 by midday of Tuesday the week after each lab.** Answers written in the lab manual (for the latter part of the course) will be marked as you complete them.

Pre-Lab Quizzes
Each experiment you perform in the lab is accompanied by a pre-lab quiz, located on LEARN. These quizzes must be completed prior to the corresponding laboratory session, and contribute to your laboratory work grade.

Reports
The formal laboratory reports that are required to be handed in as part of the course assessment should be written up separately (either typed or hand-written), and submitted with attached SPCS cover sheets by the appropriate deadline. Reports **MUST** be handed in by the required deadline - late reports will be assigned a zero mark.

Learning Outcomes
Mastery of the topics listed below as demonstrated by your performance in the various assessment components.

Goal of the Course
Practical biochemistry involves the preparation of all sorts of organic, inorganic, organometallic, and biological compounds, and the measurement of their properties and reactions. Because of the diversity of materials, a wide variety of laboratory techniques can be acquired while carrying out synthesis, purification, and analysis. This laboratory course presents some of the more common methods of characterisation which can be carried out on chemical compounds. It is important to have an awareness of how these can be applied, what information they offer and their limitations to be able to carry out the chemical detective work, which is research. The analysis of compounds and compound behaviour is essential in the understanding of biochemistry and its place in our society.

This laboratory course has been designed to introduce you to the practical skills necessary to carry out the synthesis and characterisation of chemical compounds and to introduce you to some important chemical and biochemical techniques.

Summary of the Course Content
Each student will carry out experiments as directed by the laboratory supervisor. This course will:

- Introduce the techniques required in a chemistry and biochemistry laboratory;
- Provide you with a degree of competency in biochemical, synthetic, and analytical chemistry;
- Provide you with the skills necessary to analyse chemicals and chemical reactions quantitatively;
- Provide practice in the use of spectroscopy and other techniques to determine the structure of compounds and the fundamental properties of their reactions;
- Introduce biochemical and chemical biology experiments;
- Introduce preparing scientific reports and documents.

GENERAL INFORMATION | TE KIMI MŌHIOHIO 2025

Policy on 'Dishonest Practice'| Ngā Takahitanga me ngā Tinihanga
The University has strict guidelines regarding 'dishonest practice' and 'breach of instructions' in relation to the completion and submission of examinable material. In cases where dishonest practice is involved in tests or other work submitted for credit, a department may choose to not mark such work – see the online guidelines in relation to 'Academic Integrity'.

The School of Physical and Chemical Sciences upholds this policy. It considers plagiarism, collusion, copying and ghost writing – all detailed below – to be unacceptable and dishonest practices:

- ***Plagiarism | Tārua Whānako*** is the presentation of any material (text, data or figures, on any medium including computer files) from any other source without clear and adequate acknowledgement of the source.
- ***Collusion*** is the presentation of work performed in whole, or in part, in conjunction with another person or persons, but submitted as if it has been completed by the named author alone. This interpretation is not intended to discourage students from having discussions about how to approach an assigned task and incorporating general ideas that come from those discussions into their own individual submissions, but acknowledgement is necessary.
- ***Copying*** is the use of material (in any medium, including computer files) produced by another person or persons with or without their knowledge and approval. **This includes copying of the lab reports (raw**

data may be shared within the group if permitted or required by the experiment) – data analysis and interpretation of obtained results MUST be performed individually.

- ***Ghost writing*** is the use of other person(s) (whether with or without payment) to prepare all or part of an item of work submitted for assessment.
- ***Generative AI Tools:*** **The following shall apply to all assessments in this course, except where a lecturer has specifically stated otherwise in written instructions for an assessment.**
  In all assessments, you are strictly prohibited from using generative artificial intelligence (AI) to generate any materials or content related to the assessment. This is because students are expected to solve problems and demonstrate knowledge and understanding without the assistance of AI. The use of AI-generated content is not permitted and may be considered a breach of academic integrity. Please ensure that all work submitted is the result of your own human knowledge, skills, and efforts.

Special consideration of assessment | Ngā Pairuri Motuhake
'Special Consideration' for an item of assessment is for students who have covered the work involved but have been prevented from demonstrating their knowledge or skills at the time of the assessment due to unforeseen circumstances, whether illness, injury, bereavement, car crash or any other extenuating circumstance *beyond one's control*. Special Consideration for a test/exam may be because a student has not sat it or has done so with impaired performance. Applications can be submitted via the above link and must be made **no later than five working days after the assessment due date**. Note that special consideration is **not available for items worth less than 10% of the overall course mark**. In the case of illness or injury, medical consultation should normally have taken place either shortly before or within 24 hours after the due date for the required work or test/examination.

Note that you may be required to sit a special exam or your grade may not be changed if there is insufficient evidence of your performance from other invigilated assessment items in the course. ***You have the right to appeal any decision.***

It is important to understand that Special Consideration is only available *where course work has been covered*, and the inability to demonstrate this fully is both *no longer possible* AND is due to *unexpected circumstances beyond one's control*. Thus Special Consideration **is NOT available for:**

- essays, assignments or quizzes where an extension of time is available to complete the assessment item (see below for the process to involved);
- missed lectures during the semester;
- experiencing examination anxiety;
- having several examinations or assessments close together;
- known impairment, such as chronic illness (medical or psychological), injury or disability unless medical evidence confirms that the circumstances were exacerbated, despite appropriate management, at the time of assessment;
- mistaking the date or time of an examination (this is a circumstance one can control!);
- failing to turn up to an examination or test because of sleeping in (a circumstance as above!);
- where applications are repeatedly made for the same or similar reason, then the application may be declined on the grounds that the reason is not unexpected;
- where the application is made at the time of the assessment but the supporting documentation is received significantly after this date or after the date results are released; or
- the application is made following the release of results (unless under exceptional circumstances).

Extensions of deadlines | Tononga Wā Āpiti
Where an extension may be granted for an assessment item, this will be decided by application to the course co-ordinator and/or the lecturer concerned.

Late withdrawal from a course
If you are prevented by extenuating circumstances from completing the course after the final date for withdrawing from the course, you may apply for special consideration for late discontinuation. For details on special consideration, or to make an application, refer to the Examinations Office website http://www.canterbury.ac.nz/exams/. Applications must be submitted ***within five days*** of the end of the main examination period for the semester.

Missing of tests | Te Matangaro i ngā Whakamātautau
In rare cases a student will not be able to sit a test. In such cases, the student should consult with the course co-ordinator to arrange alternative procedures. **This must be done well in advance of the set date for the test.**

Past tests and exams
Past tests can be found on our Chemistry Undergraduate website. Past exams can be found on the Library website.

Submission of reports and assignments
Reports (including lab reports) and assignments should be handed in on time. Extensions will be granted only in exceptional circumstances (such as illness or bereavement). If an extension is required, as early as possible you should request it from the lecturer concerned.
Note: If you do not submit an assignment for assessment, you will be allotted zero marks, which will affect your final result. You should ensure that you pick up marked assignments and keep them until the end of the course as evidence that the work was completed and marked in the case that either is disputed. To guard against accidental loss, it would be prudent to keep photocopies or electronic copies of anything submitted.

Late Work
Acceptance of late work for assessment will be at the discretion of the course coordinator and/or the lecturer concerned. If your assessment is likely to be late, please contact the relevant of these people ***before the assessment is due***. Never assume that an extension will be automatically granted – some courses have the policy of no late work being accepted. A commonly exercised policy is to deduct 10% of the total marks for each day that the work is late, where weekends and public holidays also count as such days.

Marks and Grades | Taumata Ako
The following numbers should be considered as a guide to the expected grades under normal circumstances.

Please note that for all invigilated assessments (tests and exams) worth 33% and above, failure to obtain a mark of at least 40% will result in a final grade no higher than an R at 100 and 200 level; in general this requirement will not be applied at 300 level, but if it is then the course coordinator will inform the class and it will result in a final grade no higher than a C–.

Grade:	**A+**	**A**	**A−**	**B+**	**B**	**B−**	**C+**	**C**	**C-**	**D**	**E**
Minimum mark %:	**90**	**85**	**80**	**75**	**70**	**65**	**60**	**55**	**50**	**40**	**0**

The School reserves the right to adjust this mark/grade conversion, up or down, to achieve consistency of assessments standards.

Reconsideration of Grades
Students should, in the first instance, speak to the course co-ordinator about their marks. If they cannot reach an agreeable solution, or have questions about their grade in a course, students should then speak to the Director of Undergraduate Studies, Assoc Prof Greg Russell. Students can appeal any decision made on their final grade. You can apply at the Registry for reconsideration of the final grade within four weeks of the date of publication of final results. Be aware that there are time limits for each step of the appeals process.

Student Accessibility Services | Te Whaikaha
Students can speak with someone at Student Accessibility Service, phone: 369 3334 (or ext. 93334), email: sas@canterbury.ac.nz).

Academic Advice
Assoc Prof Greg Russell is the coordinator of undergraduate chemistry courses. His interest is in the academic performance and well-being of all such students. Anyone experiencing problems with their chemistry courses or requiring guidance about their B.Sc. in Chemistry should get in contact with Greg.

Staff-Class Rep Liaison
Assoc Prof Greg Russell is in charge of liaison with students in chemistry courses. Your class will appoint a student representative to the liaison committee at the start of the semester. Please feel free to talk to the Academic Liaison or the student rep about any problems or concerns that you might have.

Greg Russell (greg.russell@canterbury.ac.nz, tel. 369 5129)
Director of Undergraduate Studies
School of Physical and Chemical Sciences
2025