



# CHEM13084 *Bio-Organic Chemistry*

## Term 2 - 2023

Profile information current as at 24/04/2024 07:06 am

All details in this unit profile for CHEM13084 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

## General Information

### Overview

This unit will build on the organic chemistry aspects learnt in first and second year to an in-depth level. In this unit, you will learn theoretical and practical chemistry applications that encompass both in-depth organic and biochemistry components. You will become familiar with laboratory compliance procedures; identify and analyse risks and the appropriate risk-minimisation approaches. The theoretical concepts will include an in-depth overview of biomolecules (such as carbohydrates, nucleic acids, lipids and proteins) associated with metabolic functions, enzymes and their regulatory behaviour and the integrated regulation of metabolic pathways. Contents covered in this unit will provide students with attributes important for further studies and/or employment in any related area in the discipline of chemistry. Contents covered in this unit will enable you to be able to evaluate the implications of in-depth bio-organic chemistry associated with biochemistry, functional foods, manufacturing, environment and medical fields. Students will enhance their practical skills by applying the knowledge gained towards the operation and maintenance of common instruments used for chemical analysis and perform appropriate in-depth bioassays.

### Details

Career Level: *Undergraduate*

Unit Level: *Level 3*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

### Pre-requisites or Co-requisites

Pre-requisite: CHEM12080 Organic Chemistry

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

### Offerings For Term 2 - 2023

- Mixed Mode

### Attendance Requirements

All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

### Residential Schools

This unit has a Compulsory Residential School for distance mode students and the details are:

Click here to see your [Residential School Timetable](#).

### Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

## Class and Assessment Overview

### Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

### Class Timetable

#### [Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

#### [Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

### Assessment Overview

#### 1. **Written Assessment**

Weighting: 20%

#### 2. **Practical Assessment**

Weighting: 30%

#### 3. **Examination**

Weighting: 50%

### Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

## CQUniversity Policies

**All University policies are available on the [CQUniversity Policy site](#).**

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

## Previous Student Feedback

### Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

#### Feedback from SUTE

##### Feedback

Students recommended that the residential school provided excellent hands-on experience that reinforced several key learning aspects of the course.

##### Recommendation

Continue to maintain the standards and quality of the delivery of the residential school.

#### Feedback from SUTE

##### Feedback

Students recommended that more interactive tools should be provided to understand some of the concepts pertaining to bioorganic reactions better.

##### Recommendation

Where feasible students will be provided with supplementary interactive learning materials to enhance their learning experience.

## Unit Learning Outcomes

### On successful completion of this unit, you will be able to:

1. Compare and contrast the structure and function of carbohydrates, nucleic acids, lipids and proteins
2. Evaluate the importance of enzymes for the regulation of metabolic processes
3. Interpret how living cells obtain biochemical energy from nutrients
4. Demonstrate skills in manipulation of laboratory apparatus, careful and systematic observation, precise recording and communication of experimental data.

The Applied Chemistry content of CU18 is in the process of applying for accreditation in 2021. As part of the content mapping against accreditation benchmarks, the learning outcomes of all units in the course have been mapped against the Learning Outcomes (LO) of the Royal Australian Chemical Institute (accrediting body).

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Written Assessment - 20%	•			
2 - Practical Assessment - 30%		•	•	•
3 - Examination - 50%	•	•	•	

## Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Communication	•	•	•	•
2 - Problem Solving	•	•	•	•
3 - Critical Thinking	•	•	•	•
4 - Information Literacy	•	•	•	•
5 - Team Work				•
6 - Information Technology Competence	•	•	•	•
7 - Cross Cultural Competence				
8 - Ethical practice				•
9 - Social Innovation				
10 - Aboriginal and Torres Strait Islander Cultures				

## Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Written Assessment - 20%	•	•	•	•		•				
2 - Practical Assessment - 30%	•	•	•		•			•		
3 - Examination - 50%	•	•	•							

## Textbooks and Resources

### Textbooks

CHEM13084

#### Prescribed

##### Biochemistry

Edition: 9th (2018)

Authors: Mary K. Campbell, Shawn O. Farrell, Shawn O. Farrell, Owen M. McDougal

Cengage Learning

ISBN: 1305961137

Binding: Hardcover

#### Additional Textbook Information

View textbooks at the CQUniversity Bookshop at <https://bookshop.cqu.edu.au/>

[View textbooks at the CQUniversity Bookshop](#)

### IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Microsoft Office

## Referencing Style

All submissions for this unit must use the referencing style: [Vancouver](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**Mani Naiker** Unit Coordinator

[m.naiker@cqu.edu.au](mailto:m.naiker@cqu.edu.au)

## Schedule

### Week 1 - 10 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Biomolecules: Carbohydrates	Chapter 16	

### Week 2 - 17 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Biomolecules: Nucleic Acids	Chapters 9, 10 and 13	

### Week 3 - 24 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Biomolecules: Lipids	Chapter 8	

### Week 4 - 31 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Biomolecules: Amino Acids and Peptides	Chapters 3 and 5	

<b>Week 5 - 07 Aug 2023</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Structure of Proteins	Chapters 4 and 5	
<b>Vacation Week - 14 Aug 2023</b>		
Module/Topic	Chapter	Events and Submissions/Topic
<b>Week 6 - 21 Aug 2023</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Enzymes	Chapter 6	<b>Written Assessment - Question and Answer</b> Due: Week 6 Monday (21 Aug 2023) 11:45 pm AEST
<b>Week 7 - 28 Aug 2023</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Enzyme Regulations	Chapter 7	
<b>Week 8 - 04 Sep 2023</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Metabolic Pathways	Chapters 15, 17, 18, 19, 20, 21, 23	
<b>Week 9 - 11 Sep 2023</b>		
Module/Topic	Chapter	Events and Submissions/Topic
The Organic Chemistry of Metabolic Pathways	Chapter 29 - McMurry JE.(2014).Organic Chemistry, 9th Ed.	
<b>Week 10 - 18 Sep 2023</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Integration and Regulation of Metabolism	Chapter 24	
<b>Week 11 - 25 Sep 2023</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Unit Review		<b>Practical Assessment - Laboratory Work and Write-up</b> Due: Week 11 Monday (25 Sept 2023) 11:45 pm AEST
<b>Week 12 - 02 Oct 2023</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Exam Revision		
<b>Review/Exam Week - 09 Oct 2023</b>		
Module/Topic	Chapter	Events and Submissions/Topic
		Examination - date to be confirmed
<b>Exam Week - 10 Oct 2023</b>		
Module/Topic	Chapter	Events and Submissions/Topic
		Examination - date to be confirmed

## Term Specific Information

All recorded lectures and additional learning resources will be made available online. It is mandatory for ALL STUDENTS to attend a three-day residential school at the North Rockhampton campus.

## Assessment Tasks

# 1 Written Assessment - Question and Answer

## Assessment Type

Written Assessment

## Task Description

This assessment aims to evaluate your understanding of the concepts covered in the unit by applying them to answer a series of questions. Students will analyse and differentiate the structure and function of essential biomolecules, namely carbohydrates, nucleic acids, lipids, and peptides. Each question carries a specific mark, which is clearly stated in the assessment item. Please ensure that you provide explanations for each answer, and if calculations are necessary, include all relevant workings.

## Assessment Due Date

Week 6 Monday (21 Aug 2023) 11:45 pm AEST

Please submit your assessment via Moodle in the form of a Microsoft Word document

## Return Date to Students

Week 7 Friday (1 Sept 2023)

Your graded assessment will be returned to you through the assessment task feedback file in Moodle

## Weighting

20%

## Minimum mark or grade

50%

## Assessment Criteria

Marks will be awarded for each question as specified in the assessment item (please refer to the Moodle site for more information).

## Referencing Style

- [Vancouver](#)

## Submission

Online

## Submission Instructions

Please ensure that you submit your Microsoft Word document via Moodle by following the instructions provided on the Moodle site. It is your responsibility to ensure that the submission is completed by the specified due date.

## Learning Outcomes Assessed

- Compare and contrast the structure and function of carbohydrates, nucleic acids, lipids and proteins

## Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence

# 2 Practical Assessment - Laboratory Work and Write-up

## Assessment Type

Practical Assessment

## Task Description

During the residential school, you will engage in various chemical analysis and qualitative measurements to explore the principles related to biochemical pathways and reactions. At the conclusion of the residential school, you will need to individually submit a comprehensive report for each experiment conducted. The report should include the following sections:

- Title
- Introduction
- Objectives
- Results (tables, graphs, etc.)
- Discussion
- Conclusions
- References

Please ensure that your reports are word-processed and submitted as Microsoft Word documents through Moodle. It is your responsibility to ensure that the submission is completed by the specified due date.

**Assessment Due Date**

Week 11 Monday (25 Sept 2023) 11:45 pm AEST

Please submit your assessment via Moodle in the form of a Microsoft Word document

**Return Date to Students**

Week 12 Friday (6 Oct 2023)

Your graded assessment will be returned to you through the assessment task feedback file in Moodle

**Weighting**

30%

**Minimum mark or grade**

50%

**Assessment Criteria**

The percentage weighting for each experiment, including both the laboratory work and the write-up, will be equal. The marks for each report will be assigned according to the marking rubric sheet, which will be provided on Moodle for your reference.

**Referencing Style**

- [Vancouver](#)

**Submission**

Online

**Submission Instructions**

Please ensure that you submit your Microsoft Word document via Moodle by following the instructions provided on the Moodle site. It is your responsibility to ensure that the submission is completed by the specified due date.

**Learning Outcomes Assessed**

- Evaluate the importance of enzymes for the regulation of metabolic processes
- Interpret how living cells obtain biochemical energy from nutrients
- Demonstrate skills in manipulation of laboratory apparatus, careful and systematic observation, precise recording and communication of experimental data.

**Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Team Work
- Ethical practice

## Examination

**Outline**

Complete an invigilated examination.

**Date**

During the examination period at a CQUniversity examination centre.

**Weighting**

50%

**Length**

180 minutes

**Minimum mark or grade**

50%

**Exam Conditions**

Closed Book.

**Materials**

Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).

Calculator - all non-communicable calculators, including scientific, programmable and graphics calculators are authorised



## Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

### What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

### Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

### Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

### What can you do to act with integrity?



#### Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



#### Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



#### Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem