



# CHEM11044 Chemical Reactions

## Term 2 - 2023

Profile information current as at 27/04/2024 02:05 pm

All details in this unit profile for CHEM11044 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 provide you with an understanding of the fundamental principles of chemical kinetics, thermodynamics, redox chemistry, equilibrium, pH, basic spectroscopy and organic reactions and mechanisms. You will learn about reactions and how they can be manipulated. You will be introduced to a range of chemical calculations involving rates, cell potentials, equilibrium constants, and pH, as well as techniques for analysing spectral data for chemical structure determination. This unit will provide a strong foundation for further studies in analytical and materials sciences, physical and organic chemistry. This unit has a compulsory residential school. These laboratory sessions will emphasise laboratory safety and compliance, and introduce you to skills relating to sample preparation, data collection, synthesis, spectroscopic analyses and report writing.

### Details

Career Level: *Undergraduate*

Unit Level: *Level 1*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

### Pre-requisites or Co-requisites

Prerequisite: CHEM11043 Atoms, Molecules and Matter

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. **Take Home Exam**

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 comments

**Feedback**

Res-school staff were fantastic

**Recommendation**

This is very encouraging feedback. Continue to deliver a high quality and engaging residential school.

#### Feedback from SUTE comments

**Feedback**

Poor audio quality in some of the videos that made it challenging to follow the teacher's lecture.

**Recommendation**

Review recordings and rerecord lectures with inferior audio.

#### Feedback from SUTE comments

**Feedback**

Sequencing of content (spectroscopy being split between the start and end of term) was very difficult to deal with.

**Recommendation**

Re-organise spectroscopy topics in a manner that shows better links between concepts and will make their learning more meaningful.

#### Feedback from SUTE comments

**Feedback**

Res school experiments need to be reviewed and rewritten to have clearer instructions + visual aids (video demonstration to watch before res school would be helpful)

**Recommendation**

Properly review the lab manual and PowerPoint so that the correct instructions are given to the students.

#### Feedback from SUTE comments

**Feedback**

It'll be helpful if there's minimal uploaded lecture just on the Week # that we are doing Res School.

**Recommendation**

Considering and minimising the learning content for res school week such as give students either that week off, or a week in lieu if it spills across multiple teaching weeks, re-map the topics.

## Unit Learning Outcomes

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

1. Apply concepts of kinetics, thermodynamics and redox chemistry
2. Use critical reasoning to apply chemical theories to reactions
3. Demonstrate an understanding of equilibrium and acid / base chemistry
4. Synthesise organic compounds and examine these for purity
5. Interpret a range of spectra and use these to identify compounds
6. Demonstrate competency in experimental techniques and lab safety, data generation, analysis and report writing.

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - Written Assessment - 20%	•	•				
2 - Practical Assessment - 30%				•	•	•
3 - Take Home Exam - 50%	•	•	•		•	

### Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
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						

## Textbooks and Resources

### Textbooks

CHEM11044

#### Prescribed

##### Chemistry (Fifth Edition)

Edition: 5th (2023)

Authors: Allan Blackman, Steven Bottle, Siegbert Schmid, Mauro Mocerino, Ulta Willie

Wiley

QLD

ISBN: 0-471-47811-3

Binding: Hardcover

#### Additional Textbook Information

**(Note:** You can still use the 4th Edition if you currently have one but you need to cross-check reading materials and tutorial questions)

[View textbooks at the CQUniversity Bookshop](#)

### IT Resources

You will need access to the following IT resources:

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

## Referencing Style

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

For further information, see the Assessment Tasks.

## Teaching Contacts

**Ty Jones** Unit Coordinator

[t.h.jones@cqu.edu.au](mailto:t.h.jones@cqu.edu.au)

## Schedule

### Week 1 - 10 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Reaction Kinetics	15	

### Week 2 - 17 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Chemical Thermodynamics	8	

### Week 3 - 24 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Oxidation and Reduction	12	

### Week 4 - 31 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
--------------	---------	------------------------------

Organic Chemistry Review 16, 18, 19, 21, 22, 23

#### Week 5 - 07 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
Structure Determinations or Spectroscopy 1	20	

#### Vacation Week - 14 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
--------------	---------	------------------------------

#### Week 6 - 21 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
Structure Determinations or Spectroscopy 2	20	<b>Assessment 1 Written Assessment (Short Answer Questions)</b> Due: Week 6 Monday (21 Aug 2023) 11:55 pm AEST

#### Week 7 - 28 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
Stereochemistry / Organic Chemistry Reactions 1	18 & 19	

#### Week 8 - 04 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
Residential School		

#### Week 9 - 11 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
Organic Chemistry Reactions 2	18 & 19	

#### Week 10 - 18 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
Chemical Equilibrium	9	<b>Assessment 2: Unknown Compounds Practical Report</b> Due: Week 10 Monday (18 Sept 2023) 11:55 pm AEST

#### Week 11 - 25 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
Acids and Bases	11	

#### Week 12 - 02 Oct 2023

Module/Topic	Chapter	Events and Submissions/Topic
Revision	8, 9, 11, 12, 15- 23	<b>Assessment 3 Take-Home Exam</b> Due: Week 12 Friday (6 Oct 2023) 11:55 pm AEST

## Term Specific Information

Four days of Residential Schools at North Rockhampton campus are mandatory for all students. Students must register themselves (Class Registration) for T2 2023 CHEM11042 Residential School. Visit the MyCQU Student Portal at <http://my.cqu.edu.au/> and log in using your Student ID and password. The instruction sheet is available in Moodle under the Laboratory Residential School tile. Online (Zoom) lecture and Q&A sessions are available weekly (refer to Moodle for more information).

## Assessment Tasks

# 1 Assessment 1 Written Assessment (Short Answer Questions)

## Assessment Type

Written Assessment

## Task Description

This assessment will require you to interpret and attempt short answer questions related to content in weeks 1, 2, 3, 4, and 5. All submissions should be typed as a word document. Students must show all calculations where appropriate. Further detail and instructions will be given in the Moodle site.

## Assessment Due Date

Week 6 Monday (21 Aug 2023) 11:55 pm AEST

## Return Date to Students

Week 8 Monday (4 Sept 2023)

## Weighting

20%

## Minimum mark or grade

50%

## Assessment Criteria

Marks will be awarded for:

- application and explanation of chemical thermodynamic concepts.
- relevance and clarity of diagrams where appropriate.
- correct drawing structures and names, formula of organic chemistry compounds.
- clarity of explanations where appropriate.
- correct calculations and use of significant figures and units.

## Referencing Style

- [Vancouver](#)

## Submission

Online

## Submission Instructions

Submit your work on the Moodle site as a Word document.

## Learning Outcomes Assessed

- Apply concepts of kinetics, thermodynamics and redox chemistry
- Use critical reasoning to apply chemical theories to reactions

# 2 Assessment 2: Unknown Compounds Practical Report

## Assessment Type

Practical Assessment

## Task Description

The Unknown Compounds Practical will be required to be written as a full scientific laboratory report. Guidelines for writing this report will be given in the laboratory manual and on the Moodle site.

Please see the unit Moodle site for the latest details regarding the Residential School offering.

## Assessment Due Date

Week 10 Monday (18 Sept 2023) 11:55 pm AEST

## Return Date to Students

Week 12 Monday (2 Oct 2023)

## Weighting

30%

## Minimum mark or grade

50%

## Assessment Criteria

Marks will be awarded for:

- Following the format of the Report Guidelines as detailed in the laboratory manual .
- Providing clear statement of the aim(s) of the practical of what you expect to learn from the practical.
- Describing the relevant theory comprehensively.
- Recording data correctly in a tabular manner.

- Interpreting wet chemical tests and quantitative spectra correctly with comprehensive evidence to draw valid conclusions.
- Calculating data correctly.
- Determining results correctly, include appropriate units.
- Explaining the results of the experiment using relevant terms and theories or questions listed in the manual as a guide correctly.
- Providing a brief conclusion as a summation of the experiment. It should clearly and concisely state what was learned and its importance.

### Referencing Style

- [Vancouver](#)

### Submission

Online

### Submission Instructions

Submit your work on the Moodle site as a Word document.

### Learning Outcomes Assessed

- Synthesise organic compounds and examine these for purity
- Interpret a range of spectra and use these to identify compounds
- Demonstrate competency in experimental techniques and lab safety, data generation, analysis and report writing.

## 3 Assessment 3 Take-Home Exam

### Assessment Type

Take Home Exam

### Task Description

Assessment 3 is a written take-home exam comprised of a series of questions that will cover the topics you have studied during term.

### Assessment Due Date

Week 12 Friday (6 Oct 2023) 11:55 pm AEST

The Take-Home Assessment Questions will be available on Wednesday 4 October 2023 at 10:00 AM (AEST) and is due on Friday 6 October 2023 at 11:55PM (AEST)..

### Return Date to Students

At Certification of Grades.

### Weighting

50%

### Minimum mark or grade

50%

### Assessment Criteria

Marks will be awarded for each question as indicated in the assessment item e.g., correct explanation, correct answers, show all working or reasoning for answers, correct units, correct formula, correct organic chemistry reactions, IUPAC names. Further details will be provided on the Moodle site.

### Referencing Style

- [Vancouver](#)

### Submission

Online

### Submission Instructions

Submit your work on the Moodle site as a Word document and by the due date stated on the Moodle site.

### Learning Outcomes Assessed

- Apply concepts of kinetics, thermodynamics and redox chemistry
- Use critical reasoning to apply chemical theories to reactions
- Demonstrate an understanding of equilibrium and acid / base chemistry
- Interpret a range of spectra and use these to identify compounds



## 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