CHEM11044 *Chemical Reactions*

Term 2 - 2024

Profile information current as at 07/07/2025 07:36 am

Corrections

Unit Profile Correction added on 10-07-24

To accommodate more students this term, a second residential school is scheduled from September 26th to 29th, 2024. As a result, students must submit Assessment 2: Unknown Compounds Practical Report one week after the second residential school concludes. This timing conflicts with Assessment 3 - the Take-Home Exam. To resolve this issue, Assessment 3 has been rescheduled to better align with the new residential school timeline. The updated schedule is as follows:

Assessment 3: Take-Home Exam Opens: Wednesday, 9 October 2024, 10:00 AM (AEST) Due: Friday, 11 October 2024, 10:00 AM (AEST).

Assessment 2: Unknown Compounds Practical Report.

- Residential School 2 (26th - 29th September 2024), Due : Sunday, 6 October 2024, 23:55 PM (AEST)

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 - 2024

- 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).

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

Feedback

A student commented that this unit is great at delivering content in a way that is better understood than the textbooks themselves and is well supported with an online study mode. The student stated they would recommend this unit to anyone who wants to further their understanding of chemical reactions.

Recommendation

I recommend that the teaching team continues with its good efforts in learning, teaching, assessment to maintain positive feedback from our students.

Feedback from SUTE

Feedback

Students commented that the staff were very patient, friendly, encouraging and showed great enthusiasm for the content during the residential school. The coordinator and lab techs were complimented on their skill, knowledgeable and assistance with both coursework and residential school tasks.

Recommendation

I recommend that the residential school staff and teaching team continues with their great support for our students during the residential school.

Feedback from SUTE

Feedback

Students commented that the unit helped them to improve their understanding of chemistry accurately.

Recommendation

I recommend that the teaching team continue their teaching efforts and implement any further improvements in learning, teaching, assessment wherever possible.

Feedback from SUTE

Feedback

Students suggested updating the laboratory manual for clearer instructions and calculations.

Recommendation

I recommend that the teaching team update the laboratory manual, incorporating simple language and providing clear requirements for calculations.

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

— N/A Level | • Introductory Level | • Intermediate Level | • Graduate Level | ◦ Professional Level | ◦ Advanced Level

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
Brisbane , QLD , Australia
ISBN: 9780730396673
Binding: Hardcover

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

Schedule

Week 1 - 08 Jul 2024

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

Week 2 - 15 Jul 2024

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

Week 3 - 22 Jul 2024

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

Week 4 - 29 Jul 2024

Module/Topic	Chapter	Events and Submissions/Topic
Organic Chemistry Review	16 & 18	

Week 5 - 05 Aug 2024

Module/Topic	Chapter	Events and Submissions/Topic

Structure Determinations or Spectroscopy 1	20	

Vacation Week - 12 Aug 2024

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 19 Aug 2024

Module/Topic	Chapter	Events and Submissions/Topic
Structure Determinations or Spectroscopy 2 & Residential School	20	**Assessment 1 Written Assessment (Short Answer Questions)** Due: Week 6 Monday (19 Aug 2024) 11:55 pm AEST

Week 7 - 26 Aug 2024

Module/Topic	Chapter	Events and Submissions/Topic
Residential School		

Week 8 - 02 Sep 2024

Module/Topic	Chapter	Events and Submissions/Topic
Stereochemistry / Organic Reactions 1	17	**Assessment 2: Unknown Compounds Practical Report** Due: Week 8 Friday (6 Sept 2024) 11:55 pm AEST

Week 9 - 09 Sep 2024

Module/Topic	Chapter	Events and Submissions/Topic
Organic Chemistry Reactions 2	19, 21 and 23	

Week 10 - 16 Sep 2024

Module/Topic	Chapter	Events and Submissions/Topic
Chemical Equilibrium	9	

Week 11 - 23 Sep 2024

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

Week 12 - 30 Sep 2024

Module/Topic	Chapter	Events and Submissions/Topic
Revision	All chapters from Week 1 to Week 11.	**Assessment 3 Take-Home Exam** Due: Week 12 Friday (4 Oct 2024) 10:00 am AEST

Review/Exam Week - 07 Oct 2024

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 14 Oct 2024

Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

Attendance at the four-day Residential Schools at the North Rockhampton campus is mandatory for all students. To register for the T2 2024 CHEM11044 Residential School, students must log in to the MyCQU Student Portal at http://my.cqu.edu.au/ using their Student ID and password. The instruction sheet can be found on Moodle under the Laboratory Residential School tile. Weekly Q&A sessions are also available; please refer to Moodle for more information. Students are responsible for upholding academic integrity in all aspects of their work when undertaking education in this unit, including assessment. It is expected that all assessments are their own work; no part of the assessment should be completed by another person, group, or artificial intelligence unless explicitly required.

Assessment Tasks

1 Assessment 1 Written Assessment (Short Answer Questions)

Assessment Type
Written Assessment

Task Description
This assessment will require you to interpret and answer short-answer questions related to content covered from week 1 to week 5. All submissions should be typed as a Word document. Students must show all calculations where appropriate. Additional details and instructions will be provided on the Moodle site.

Assessment Due Date
Week 6 Monday (19 Aug 2024) 11:55 pm AEST

Return Date to Students
Week 8 Friday (6 Sept 2024)

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 8 Friday (6 Sept 2024) 11:55 pm AEST

Return Date to Students
Week 10 Friday (20 Sept 2024)

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.
- Meeting the marking rubric.
- Providing clear statement(s) of the aim(s) of the practical, i.e., 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, including approriate units.
- Explaining the results of the experiment using relevant terms and theories, utilising questions listed in the laboratory manual as a guide).
- Providing a brief conclusion as a summation of the experiment. It should clearly and concisely state what was learned and its importance.
- Correctly using the Vancouver referencing style.

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 the term.

Assessment Due Date
Week 12 Friday (4 Oct 2024) 10:00 am AEST

The Take-Home Exam, Questions will be available on Wednesday, 2 October 2024, 10:00 AM (AEST) and is due on Friday, 4 October 2024, 10:00 AM (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 as a Word document on the Moodle site by the stated due date.

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