CHEM11044 *Chemical Reactions*
Term 2 - 2020

Profile information current as at 09/04/2024 10:14 pm

General Information

Overview

In this unit, you will learn practical chemistry applications including sample acquisition, chain-of-custody, storage, analysis and reporting. You will become familiar with laboratory compliance procedures, identify risks and appropriate risk-minimisation approaches. The theoretical concepts will include naming of compounds, electrochemistry and its applications, pH, acidity and buffering capacity of solutions, reaction rates and kinetics, organic reaction mechanisms, and basic atomic and molecular spectroscopy. This unit will set a strong foundation for studies in analytical and materials sciences, physical and interface chemistry. You will also be able to examine the energies associated with electrochemical reactions that underpin important processes such as electricity generation, renewable energies, corrosion and electroplating. Accompanying the theory, you will enhance your practical skills by learning the operation and maintenance of common instrumentation in the laboratory, and perform advanced titrations, measure soil acidity, and synthesise, and determine yield and purity of, organic products. On-campus students will attend regular laboratory sessions and there is a compulsory residential school for distance students.

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 - 2020

- 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 Have Your Say

Feedback

The best aspects of the unit were that lecturers took time to present the more complex aspects of topics in a logical sequence. Tutorial sessions were also well explained which helped students understand the content.

Recommendation

We will continue to maintain high standards set going forward.

Feedback from Have Your Say

Feedback

There was not enough time in the residential school to complete the experiments and proformas.

Recommendation

We have planned to increase the residential school duration from 3 to 4 days in 2020. It is also noted that there wont be any internal laboratory classes scheduled in 2020.

Feedback from Have Your Say

Feedback

Learning Resources: Students wanted the most updated version of laboratory manual made available at the beginning of the term.

Recommendation

A thorough review of the laboratory manual will be undertaken before 2020 offering. The most updated version will be uploaded on Moodle at the beginning of the term.

Unit Learning Outcomes

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

1. Apply concepts of chemical bonding and reaction energies to chemical synthesis and processes
2. Use critical reasoning to apply chemical theories to reactions
3. Demonstrate an understanding of buffer chemistry with regard to preparation, buffer capacity and pH
4. Synthesise organic compounds and examine these for purity
5. Interpret a range of spectra, including infrared, nuclear magnetic resonance and mass spectroscopy, to identify compounds
6. Demonstrate competency in laboratory compliance procedures, experimental techniques, 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%	•	•				

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
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						

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 - Take Home Exam - 50%	•	•	•							

Textbooks and Resources

Textbooks

CHEM11044

Prescribed

Chemistry
Edition: 4th (2019)
Authors: Allan Blackman, Steven Bottle, Siegbert Schmid, Mauro Mocerino, Uta Willie
Wiley
Milton , QLD , Australia
ISBN: 0-471-47811-3
Binding: Paperback

Additional Textbook Information
If you prefer to study with a paper copy, they are available at the CQUni Bookshop here: http://bookshop.cqu.edu.au (search on the Unit code). eBooks are available at the publisher's website.

View textbooks at the CQUniversity Bookshop

IT Resources

You will need access to the following IT resources:

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

Referencing Style

All submissions for this unit must use the referencing style: Vancouver
For further information, see the Assessment Tasks.

Teaching Contacts

Shaneel Chandra Unit Coordinator
s.chandra@cqu.edu.au
Ty Jones Unit Coordinator
t.h.jones@cqu.edu.au

Schedule

Week 1 - 13 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Sampling and Spectroscopic Techniques/Chemical Reactions	3, to be advised	

Week 2 - 20 Jul 2020

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

Week 3 - 27 Jul 2020

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

Week 4 - 03 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Electrochemistry	12	

Week 5 - 10 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Reaction Kinetics	15	**Written Assessment (Short Answer Questions)** Due: Week 5 Friday (14 Aug 2020) 11:55 pm AEST

Vacation Week - 17 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 24 Aug 2020

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

Week 7 - 31 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Stereochemistry	17	

Week 8 - 07 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
Reactions of Organic Compounds-Part 1	16, 18	

Week 9 - 14 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
Reactions of Organic Compounds-Part 2	19, 21, 23	

Week 10 - 21 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
Spectroscopy-Part 1	20	

Week 11 - 28 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
Spectroscopy-Part 2	20	

Week 12 - 05 Oct 2020

Module/Topic	Chapter	Events and Submissions/Topic
Review		

Review/Exam Week - 12 Oct 2020

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 19 Oct 2020

Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

Due to COVID-19 impacts at the time of preparing this unit profile, the residential school attached to this unit for Term 2 2020 has been postponed and will need to be completed at a later date. Further details will be made available on the unit Moodle site in due course.

Assessment Tasks

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, and 3. You will be required to type your solutions and clearly show any calculations where appropriate. Further detail and instructions will be given on the unit Moodle site.

Assessment Due Date
Week 5 Friday (14 Aug 2020) 11:55 pm AEST
Submissions via the Moodle site for CHEM11044 and must be in MS Word format

Return Date to Students
Week 6 Friday (28 Aug 2020)
Two weeks after submission with feedback via Moodle.

Weighting
20%

Assessment Criteria
Marks for each question will be awarded as indicated on the assessment item.
Marks will be awarded for:
- application and explanation of relevant content pertaining to chemical thermodynamics and equilibrium
- relevance and clarity of diagrams where appropriate
- clarity of explanations where appropriate
- correct calculations and use of significant figures and units

Referencing Style

- Vancouver

Submission
Online

Submission Instructions
Submissions must be in Microsoft Word Format on the Moodle Unit site

Learning Outcomes Assessed

- Apply concepts of chemical bonding and reaction energies to chemical synthesis and processes
- Use critical reasoning to apply chemical theories to reactions

Graduate Attributes

- Communication
- Problem Solving
- Information Technology Competence

2 Practical Assessment

Assessment Type
Practical Assessment

Task Description
During a compulsory residential school, you will complete eight practicals that have been designed to reinforce topics covered in lectures. You will be required to collect results, analyse data, and report your findings in an appropriate manner.
Seven of the practicals will be completed using a Profoma that you will fill out. One "Unknown Practical" will be required to be written up as a full scientific laboratory report.
Further detail and instructions will be given on the unit Moodle site.
Due to COVID-19 impact, Residential School details have not yet been finalised. Please see the unit Moodle site for the latest details regarding the Residential Schol offering.

Assessment Due Date

Proforma will be due at the end of each practical session. The Unknown Practical report will be due two weeks after a compulsory Residential School. For more details refer to the unit Moodle site CHEM11044

Return Date to Students

Proforma will be assessed and returned in the following practical session. The Practical Report will be returned two weeks after submission.

Weighting
30%

Assessment Criteria
This task will be assessed in the following ways:
Proformas:
Clearly outline the results, data interpretation and analysis, including calculations.
Weighting – Each proforma will be worth 3% (21 % in total).
Unknown Practical (To be submitted Online):
Full report clearly describing with logic on how you identified the unknown compounds
Weighting – 9%

Referencing Style

- Vancouver

Submission
Online

Submission Instructions
Submit your work on the unit Moodle - CHEM11044 in MS Word Format

Learning Outcomes Assessed

- Demonstrate an understanding of buffer chemistry with regard to preparation, buffer capacity and pH
- Synthesise organic compounds and examine these for purity
- Interpret a range of spectra, including infrared, nuclear magnetic resonance and mass spectroscopy, to identify compounds
- Demonstrate competency in laboratory compliance procedures, experimental techniques, data generation, analysis and report writing.

Graduate Attributes

- Communication
- Problem Solving
- Team Work
- Information Technology Competence

3 Take Home Assessment

Assessment Type
Take Home Exam

Task Description
Assessment 3 is a written take-home assessment comprised of a series of questions that will cover the content you have studied during this term. This assessment is designed to assess your comprehension of the concepts and learning outcomes presented in the unit.

Assessment Due Date

Take home assessment- submission date and time to be advised on Moodle.

Return Date to Students

Three weeks after submissions

Weighting
50%

Minimum mark or grade
40%

Assessment Criteria
Marks will be awarded for each question as indicated in the assessment item. All submissions should be typed and saved

as a word document.

Weighting

50%

Referencing Style

- Vancouver

Submission

Online

Submission Instructions

Submissions must be in Microsoft Word Format to the unit Moodle Shell CHEM11044

Learning Outcomes Assessed

- Apply concepts of chemical bonding and reaction energies to chemical synthesis and processes
- Use critical reasoning to apply chemical theories to reactions
- Demonstrate an understanding of buffer chemistry with regard to preparation, buffer capacity and pH
- Interpret a range of spectra, including infrared, nuclear magnetic resonance and mass spectroscopy, to identify compounds

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking

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