CHEM19085 *Environmental Chemistry*
Term 1 - 2019

Profile information current as at 04/05/2024 07:49 am

Corrections

Unit Profile Correction added on 27-03-19

Under **General Information**, *Offerings for Term 1 - 2019*, "Rockhampton" needs to be deleted. This unit is only delivered via Mixed Mode.

General Information

Overview

This unit examines air pollution: ozone depletion, sulfur oxides, photochemical smog and greenhouse effects; water pollution; inorganic and organic pollutants, surfactants and detergents; hazardous wastes: classification, treatment, disposal; pollution monitoring: sampling procedures, analytical methods and modelling techniques. The ecological and health effects of chemical pollution are presented and discussed. Renewable energy and energy utilisation is investigated. Distance education students will be required to attend a residential school for this unit.

Details

Career Level: *Undergraduate*
Unit Level: *Level 2*
Credit Points: *6*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites

Prerequisites: CHEM11041 Chemistry for the Life Sciences
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 1 - 2019

- Mixed Mode
- Rockhampton

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: 25%
2. **Practical and Written Assessment**
Weighting: 25%
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 Unit Evaluation

Feedback

Students appreciated worked answers to problems/calculations on Moodle. Residential school allowed a gain experience in a range of laboratory skills and with a wide variety of laboratory technology. Field trip to Mount Morgan Mine was highlighted as an good authentic learning experience.

Recommendation

The practice of providing problem to solve each week with answers will continue. Mount Morgan sampling trip will also be continued.

Feedback from Unit Evaluation

Feedback

Students mentioned that researching the ionic composition in different water types is very difficult and comparisons aren't valid across different regions.

Recommendation

I recognise the difficulty the students have highlighted and will amend Written Assessment 1 accordingly to give the task expectations more clarity.

Feedback from Unit Evaluation

Feedback

Revisions to the methods in the Lab Manual made it difficult to follow.

Recommendation

All the shortcomings in the the residential school experiments and the Lab Manual have been noted. In 2019, the Manual will have greater clarity.

Unit Learning Outcomes

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

1. Understand the chemical principles relating to the chemistry of the different spheres of the environment: atmosphere, hydrosphere, lithosphere and biosphere.
2. Use laboratory skills to make reliable analytical measurements to assess the quality of water, air, soil and food sources.
3. Be familiar with the important environment regulating authority and environmental guidelines.
4. Use research skills to obtain information relating to environmental chemical concepts, environmental issues and current approaches to solve these.

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
1 - Written Assessment - 25%	•		•	•

Assessment Tasks	Learning Outcomes			
	1	2	3	4
2 - Practical and Written Assessment - 25%		•		•
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 - 25%	•	•	•	•		•	•			
2 - Practical and Written Assessment - 25%	•	•	•	•	•	•		•		
3 - Examination - 50%	•	•	•	•						

Textbooks and Resources

Textbooks

CHEM19085

Prescribed

Environmental Chemistry
(2012)
Authors: Colin Baird, Michael Cann
Macmillan Science and Education
New York , NY , USA
ISBN: 9781429277044
Binding: Hardcover

Additional Textbook Information
Electronic copies of the text will also suffice. However, if you prefer a hard copy, they are available at the CQUni Bookshop here: http://bookshop.cqu.edu.au (search on the Unit code)

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

Schedule

Week 1 - 11 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Water: acid-base chemistry of natural waters	Supplement lecture material with textbook (Baird & Cann): Chapters 10, 3	

Week 2 - 18 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Water: Redox chemistry of natural waters	Chapter 10	

Week 3 - 25 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Water: Water pollution and water purification	Chapter 11	

Week 4 - 01 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Water: BOD/COD, Nutrients, Hydrological cycle	Chapters 10, 11	

Week 5 - 08 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Air: Stratospheric chemistry; ozone holes	Chapters 1, 2, 17	**Problem-solving and writing** Due: Week 5 Friday (12 Apr 2019) 12:00 pm AEST

Vacation Week - 15 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 22 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Air: Oxygen chemistry and the stratosphere	Chapters 1, 2, 17	

Week 7 - 29 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Air: Ground-level air pollution; environmental & health consequences	Chapters 3, 4	

Week 8 - 06 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Air: Ground-level air pollution; environmental & health consequences	Chapters 3, 4	

Week 9 - 13 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Module 3 Energy & Climate Change: greenhouse effect; fossil-fuel energy; carbon dioxide emissions; global warming **Module 4** Ecological & human health: Toxic organic compounds	Chapters 5, 6, 7, 8	

Week 10 - 20 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Module 3 Energy & Climate Change: Renewable energy, alternative fuels & the hydrogen economy	Chapters 5, 6, 7., 8	**Report from Residential School** Due: Week 10 Friday (24 May 2019) 12:00 pm AEST

Week 11 - 27 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Module 4 Ecological & human health: Toxic heavy metals	Chapter 12	

Week 12 - 03 Jun 2019

Module/Topic	Chapter	Events and Submissions/Topic
Module 4 Ecological & human health: Wastes, soils and sediments	Chapter 16	

Review/Exam Week - 10 Jun 2019

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 17 Jun 2019

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Problem-solving and writing

Assessment Type
Written Assessment

Task Description
This assessment task relates to the Unit Learning Outcomes 1, 2, 3 and 4. It is to be submitted online through the Moodle support site for this unit. This assessment task requires some research (i.e. you need to consult references outside of the textbook; however, do not limit yourself to the internet). It is important to start on this assessment task as early as possible. Remember to always cite your sources throughout your report.
There are 2 parts to Assessment Task 1. Part A requires you to solve numerical and descriptive problems, Part B requires you to research an issue that was raised in the local media and write as a scientist to the newspaper concerned clarifying the issue.

Assessment Due Date
Week 5 Friday (12 Apr 2019) 12:00 pm AEST

Return Date to Students
Week 7 Friday (3 May 2019)
Feedback and marks to be tendered via Moodle.

Weighting
25%

Minimum mark or grade
30%

Assessment Criteria
Part A (50%)
Full marks for correct answers and partial marks depending on accuracy of answers.

Part B (50% - fractions denote the proportion of mark)
Clear organisation and presentation of material; conciseness and accuracy (0.3).
Reliability of information/data provided (0.3).
Writing suitable for general media audience (0.2)
Use of relevant and reliable sources of information, with proper citation of any sources used (0.2).

Referencing Style

- Vancouver

Submission
Online

Submission Instructions
To be submitted individually via Moodle.

Learning Outcomes Assessed

- Understand the chemical principles relating to the chemistry of the different spheres of the environment: atmosphere, hydrosphere, lithosphere and biosphere.
- Be familiar with the important environment regulating authority and environmental guidelines.
- Use research skills to obtain information relating to environmental chemical concepts, environmental issues and current approaches to solve these.

Graduate Attributes

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

- Cross Cultural Competence

2 Report from Residential School

Assessment Type
Practical and Written Assessment

Task Description
The objective of this assessment task is to produce a scientific laboratory report. This report will be based on the chemical analyses you have carried out during the residential school. It is important to include 'processed' data only. Raw data will not be accepted in this report. The experiment(s) to be written on will be confirmed during the term.

Assessment Due Date
Week 10 Friday (24 May 2019) 12:00 pm AEST
To be submitted individually, via Moodle

Return Date to Students
Week 12 Friday (7 June 2019)
Feedback and marks to be tendered via Moodle.

Weighting
25%

Minimum mark or grade
30%

Assessment Criteria
Title, Aim and Introduction to practical exercise: 25 marks
Outline of procedure (exact and with sufficient detail and clarity to be reproduced in another laboratory): 15 marks
Data organisation (tabulated, graphed for clarity): 15 marks
Data verification (accuracy and precision estimation): 15 marks
Comparison of data with other similar work, calculations etc.: 15 marks
Overall presentation of report, citations and referencing: 15 marks

Referencing Style

- Vancouver

Submission
Online

Submission Instructions
To be submitted individually via Moodle.

Learning Outcomes Assessed

- Use laboratory skills to make reliable analytical measurements to assess the quality of water, air, soil and food sources.
- Use research skills to obtain information relating to environmental chemical concepts, environmental issues and current approaches to solve these.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence
- 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
40

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