



CHEM19085 *Environmental Chemistry*

Term 1 - 2024

Profile information current as at 05/09/2024 01:25 pm

All details in this unit profile for CHEM19085 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.

Corrections

Unit Profile Correction added on 28-02-24

The dates entered for the residential school under Schedule are incorrect. Students are advised to refer to the Timetable for correct residential school dates.

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. You will be presented with the ecological and health effects of chemical pollution and these will be discussed. Renewable energy and energy utilisation is investigated. If you are a Distance education student, you 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

Pre-requisites: CHEM11044 Chemical Reactions OR permission from Head of Course

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 - 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: 30%

2. **Practical and Written Assessment**

Weighting: 50%

3. **Online Test**

Weighting: 20%

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 feedback

Feedback

The textbook, Environmental Chemistry 5th edn. was hard to obtain, and provides almost no worked examples making many of the calculations needlessly hard.

Recommendation

Consider including more detailed worked examples. Reconsider the need for a prescribed textbook.

Feedback from Unit feedback

Feedback

The field trip was extremely useful and provided many learning opportunities.

Recommendation

Continue with offering the residential school with associated field trip.

Feedback from Unit feedback

Feedback

Improvements I would make are making the final exam into weekly quizzes which would encourage students to complete weekly learnings.

Recommendation

The final exam is an important assessment. Consideration will be given to including weekly quizzes to maintain student engagement and reinforce learning outcomes, however the volume of assessment will need to be reviewed.

Feedback from Unit feedback

Feedback

Students question the relevance of this unit to their degree.

Recommendation

The perception among some students that the Unit is not relevant to their degree is worth examining further. This is an ongoing action that will continue to be monitored as updates are made to the unit.

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.

None

Alignment of Learning Outcomes, Assessment and Graduate Attributes



N/A
Level



Introductory
Level



Intermediate
Level



Graduate
Level



Professional
Level



Advanced
Level

Textbooks and Resources

Textbooks

CHEM19085

Prescribed

Environmental Chemistry

Edition: 5 (2012)

Authors: Colin Baird and Michael Cann

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

Shaneel Chandra Unit Coordinator

s.chandra@cqu.edu.au

Schedule

Week 1 - 04 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
It Must be In The Water: Acid-base	3	
Chemistry of Natural Waters	10	

Week 2 - 11 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Water: Redox Chemistry of Natural Waters	10	

Week 3 - 18 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Oxygen - Supply, Demand & Role in Water	11	

Week 4 - 25 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Oxygen Demand and Water Pollution	10 11	Residential School (30-31 March)

Week 5 - 01 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Air: Stratospheric Chemistry; Ozone Hole

1
2
17

Written Assessment Due: Week 5
Friday (5 Apr 2024) 11:00 am AEST

Vacation Week - 08 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 15 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
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No teaching - res school

Week 7 - 22 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Air: Oxygen Chemistry and the Stratosphere

1 - 2
17

Week 8 - 29 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Air: The Mechanism of Greenhouse Gas Action

3 - 4

Week 9 - 06 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Air: Let There be Clean Air

3 - 4

Practical and Written Assessment
Due: Week 9 Friday (10 May 2024)
11:00 am AEST

Week 10 - 13 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Energy & Climate Change: Greenhouse Effect, Fossil-fuel Energy, Carbon Dioxide Emissions, Global Warming, Ecological and Human Health: Toxic Organic Compounds

5 - 8

Week 11 - 20 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Energy & Climate Change: Renewable Energy, Alternative Fuels and the Hydrogen Economy

5 - 8

Week 12 - 27 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Pollution: Toxic Heavy Metals and Metalloids

12

Review/Exam Week - 03 Jun 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Online Test (date and time TBA)

Online Test Due: Review/Exam Week
Friday (7 June 2024) 12:00 pm AEST

Exam Week - 10 Jun 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Online Test (date and time TBA)

Assessment Tasks

1 Written Assessment

Assessment Type

Written Assessment

Task Description

The Assessment Task comprises of a mix of numerical and descriptive problems, as well as requiring you to undertake brief research on an environmental issue in Australia. It is to be submitted online through the Moodle support site for this unit.

The Assessment Task requires some research (i.e. you need to consult references outside of the textbook, including peer reviewed scientific literature such as journals). It is important to start on the Assessment Task as early as possible. Remember to always cite your sources throughout your report.

Assessment Due Date

Week 5 Friday (5 Apr 2024) 11:00 am AEST

To be submitted via Moodle.

Return Date to Students

Week 7 Friday (26 Apr 2024)

Returned with feedback via Moodle

Weighting

30%

Minimum mark or grade

50%

Assessment Criteria

Problem-solving

Full marks for correct answers and partial marks depending on accuracy of answers.

Writing Task

- Clear flow and suitability for a general audience (5 marks)
- Reliability/credibility of information/data (5 marks)
- Sound reasoning based on scientific evidence/principles in letter with good integration of information (7.5 marks)
- Correctly cited references (5 marks)
- Word count met (2.5 marks)

Referencing Style

- [Vancouver](#)

Submission

Online

Submission Instructions

Individual reports to be submitted via Moodle. For receiving detailed feedback, please ensure it is in Word format.

Graduate Attributes

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

Learning Outcomes Assessed

- 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.

2 Practical and Written Assessment

Assessment Type

Practical and Written Assessment

Task Description

The Assessment Task relates to the compulsory Residential School. The Residential School includes a field trip. You will work in pairs preparing samples and when conducting your experimental work. For the Assessment Task, you will write up an individual scientific report of the experiments and activities undertaken during the Residential School.

Assessment Due Date

Week 9 Friday (10 May 2024) 11:00 am AEST

To be submitted via Moodle.

Return Date to Students

Week 12 Friday (31 May 2024)

Returned with feedback via Moodle

Weighting

50%

Minimum mark or grade

50%

Assessment Criteria

Report Structure

Title, Aim and Introduction to practical exercise should explain the importance of the study taken and the justification of the scientific methods used. The scientific literature (e.g., include relevant chemical equations and background information) must be cited: 25 marks

Outline of procedure (exact and with sufficient detail and clarity to be reproduced in another laboratory, and in your own words rather than reproduced from the Laboratory Manual): 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

Individual reports to be submitted via Moodle. For feedback, please ensure it is in Word format.

Graduate Attributes

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

Learning Outcomes Assessed

- Understand the chemical principles relating to the chemistry of the different spheres of the environment: atmosphere, hydrosphere, lithosphere and biosphere
- Use laboratory skills to make reliable analytical measurements to assess the quality of water, air, soil and food sources
- 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.

3 Online Test

Assessment Type

Online Test

Task Description

The Online Test will be an assortment of problem-solving and extended-answer questions. The mark allocations per

question will be provided on the Assessment with each question.

The access to the Test will be for 24 hours, as explained below:

Open: 12.00 pm Thursday, 6 June

Close: 12.00 pm Friday, 7 June.

Duration of Test: 3 hours

You must open the Test within the 24 hour period and attempt it. Once opened, you will have 3 hours to answer the questions. Access to the Test within the 24-hour period will only be once. Please ensure that you have given yourself 3 hours to attempt all the questions and upload your answers and that you have Internet connectivity for the duration of the Test.

Assessment Due Date

Review/Exam Week Friday (7 June 2024) 12:00 pm AEST

To be attempted in Moodle

Return Date to Students

Exam Week Friday (14 June 2024)

Marks will be released via Moodle at Certification of Grades.

Weighting

20%

Minimum mark or grade

50%

Assessment Criteria

Each question will have the allocated marks stated.

Referencing Style

- [Vancouver](#)

Submission

Online

Submission Instructions

To be submitted by the due date and time.

Graduate Attributes

- Communication

Learning Outcomes Assessed

- Understand the chemical principles relating to the chemistry of the different spheres of the environment: atmosphere, hydrosphere, lithosphere and biosphere

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