



CHEM19085 *Environmental Chemistry*

Term 1 - 2023

Profile information current as at 07/05/2024 03:27 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 09-03-23

The residential school dates listed in the schedule are incorrect.

The residential school for this unit has been rescheduled to 27 & 28 March.

More information will be available on the Moodle site.

Please see your personal timetable for the most up to date information.

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 - 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: 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 Evaluations

Feedback

Please post the date of the final assessment in addition to just an email about the time and date as is done for other assessment tasks.

Recommendation

Concur, and going forward, the final assessment date and time will be included in the Assessment header as is done for the other assessments, on Moodle.

Feedback from Evaluations

Feedback

The lab report, while challenging provided me with more knowledge than before I attempted it. I liked how it was a local case

Recommendation

The local study component of the Residential School will be retained as it is a very strong application of the theory to practice.

Feedback from Evaluations

Feedback

This is a great unit with great applications from the res school.

Recommendation

We will continue to ensure that the residential school is interesting for students and allows them to put their theory into practice.

Feedback from Evaluations

Feedback

The unit was well organised and interesting. However, the timing of the final exam was outside of the exam block, during protected study time.

Recommendation

We will continue to aim to provide high-quality materials and a good experience for students to retain their interest in the Unit. There is no final exam in the unit - it was a final assessment instead. However, being a take-home-test, the suggestion is noted. We will do our best to ensure that this assessment does not conflict with the study period.

Feedback from Student evaluation

Feedback

The Unit is felt as not being relevant to the degree.

Recommendation

The perception among some students that the Unit is not relevant to their degree is worth examining further. Evaluations will be asked to release deidentified information about the cohort which this sentiment arose from.

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



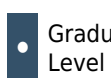
N/A
Level



Introductory
Level



Intermediate
Level



Graduate
Level



Professional
Level



Advanced
Level

Alignment of Assessment Tasks to Learning Outcomes

| Assessment Tasks | Learning Outcomes | | | |
|--------------------------------------------|-------------------|---|---|---|
| | 1 | 2 | 3 | 4 |
| 1 - Written Assessment - 30% | | | • | • |
| 2 - Practical and Written Assessment - 50% | • | • | • | • |
| 3 - Online Test - 20% | • | | | |

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 | | | | |

Graduate Attributes

Learning Outcomes

1 2 3 4

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 - 30%

| | | | | | | | | | | |
|---|---|---|---|--|---|--|--|--|--|--|
| • | • | • | • | | • | | | | | |
|---|---|---|---|--|---|--|--|--|--|--|

2 - Practical and Written Assessment - 50%

| | | | | | | | | | | |
|---|---|---|---|---|---|--|---|--|--|--|
| • | • | • | • | • | • | | • | | | |
|---|---|---|---|---|---|--|---|--|--|--|

3 - Online Test - 20%

| | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|
| • | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|

Textbooks and Resources

Textbooks

CHEM19085

Prescribed

Environmental Chemistry

Edition: 5 (2012)

Authors: Colin Baird and Michael Cann

Binding: Hardcover

Additional Textbook Information

E-copies of the textbook will suffice too. BOTH the paper and eBook copies 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)
- MS Office

Referencing Style

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

Teaching Contacts

Russell Gordon Unit Coordinator

r.j.gordon@cqu.edu.au

Schedule

Week 1 - 06 Mar 2023

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

Week 2 - 13 Mar 2023

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

Week 3 - 20 Mar 2023

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

Week 4 - 27 Mar 2023

| Module/Topic | Chapter | Events and Submissions/Topic |
|-----------------------------------|----------|------------------------------------------------------------------------------------------------------------------|
| Oxygen Demand and Water Pollution | 10 11 | Residential School (30-31 March) Written Assessment Due: Week 4 Friday (31 Mar 2023) 11:45 pm AEST |

Week 5 - 03 Apr 2023

| Module/Topic | Chapter | Events and Submissions/Topic |
|------------------------------------------|--------------|------------------------------|
| Air: Stratospheric Chemistry; Ozone Hole | 1 2 17 | |

Vacation Week - 10 Apr 2023

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

Week 6 - 17 Apr 2023

| Module/Topic | Chapter | Events and Submissions/Topic |
|--------------------------------------------|--------------|------------------------------|
| Air: Oxygen Chemistry and the Stratosphere | 1 2 17 | |

Week 7 - 24 Apr 2023

| Module/Topic | Chapter | Events and Submissions/Topic |
|---------------------------------------------|---------|------------------------------|
| Air: The Mechanism of Greenhouse Gas Action | 3 4 | |

Week 8 - 01 May 2023

| Module/Topic | Chapter | Events and Submissions/Topic |
|-----------------------------|---------|------------------------------------------------------------------------------------------|
| Air: Let There be Clean Air | 3 4 | Practical and Written Assessment Due: Week 8 Friday (5 May 2023) 11:45 pm AEST |

Week 9 - 08 May 2023

| Module/Topic | Chapter | Events and Submissions/Topic |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------------|
| Energy & Climate Change: Greenhouse Effect, Fossil-fuel Energy, Carbon Dioxide Emissions, Global Warming, Ecological and Human Health: Toxic Organic Compounds | 5 6 7 8 | |

Week 10 - 15 May 2023

| Module/Topic | Chapter | Events and Submissions/Topic |
|---------------------------------------------------------------------------------------|------------------|----------------------------------------|
| Energy & Climate Change: Renewable Energy, Alternative Fuels and the Hydrogen Economy | 5 6 7 8 | |
| Week 11 - 22 May 2023 | | |
| Module/Topic | Chapter | Events and Submissions/Topic |
| Pollution: Toxic Heavy Metals and Metalloids | 12 | |
| Week 12 - 29 May 2023 | | |
| Module/Topic | Chapter | Events and Submissions/Topic |
| Revision | | |
| Review/Exam Week - 05 Jun 2023 | | |
| Module/Topic | Chapter | Events and Submissions/Topic |
| | | Online Test (date and time TBA) |
| Exam Week - 12 Jun 2023 | | |
| Module/Topic | Chapter | Events and Submissions/Topic |
| | | 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 4 Friday (31 Mar 2023) 11:45 pm AEST

To be submitted via Moodle.

Return Date to Students

Week 6 Friday (21 Apr 2023)

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

- Clarity of description of incident
- Factual basis as evidenced by supporting literature
- The use of sound scientific reasoning in any interpretation of information
- Correctly cited references
- Presentation including adherence to 500-word limit

Detailed mark allocations will be provided on Moodle.

Referencing Style

- [Vancouver](#)

Submission

Online

Submission Instructions

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

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.

Graduate Attributes

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

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 8 Friday (5 May 2023) 11:45 pm AEST

To be submitted via Moodle.

Return Date to Students

Week 11 Friday (26 May 2023)

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 organization (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.

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.

Graduate Attributes

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

3 Online Test

Assessment Type

Online Test

Task Description

The Online Test will be an assortment of problem-solving and extended-answer questions. It will have a timed period in which it must be submitted. The specific details of the Assessment will be provided on Moodle.

Assessment Due Date

To be attempted in Moodle during the standard examination period at a date to be advised.

Return Date to Students

Marked assessments will be returned via Moodle.

Weighting

20%

Minimum mark or grade

50%

Assessment Criteria

Due to the specific nature of questions in this activity, specific instructions and assessment criteria will be further explained in the Test itself.

Referencing Style

- [Vancouver](#)

Submission

Online

Submission Instructions

To be submitted by the due date and time.

Learning Outcomes Assessed

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

Graduate Attributes

- Communication

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