CHEM19085 *Environmental Chemistry*

Term 1 - 2022

Profile information current as at 25/04/2024 07:35 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.

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 - 2022

- 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 Have Your Say

Feedback

I feel that if the importance about something was explained before the details, it would be helpful in our understanding. E.g. Carbonate chemistry calculations preceded why we need to know about Carbonate chemistry

Recommendation

This is a good suggestion. The carbonate chemistry lecture sequencing will be relooked at to ensure that calculations come after the importance of carbonates is presented. The sequencing of all other topics will also be re-checked at the same time.

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	•	•	•	•

Graduate Attributes	Learning Outcomes			
	1	2	3	4
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 - 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
All lectures and tutorial questions are inextricably linked to this textbook. Students need to have access to it each week. Electronic and hard copies are both fine.

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 - 07 Mar 2022

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

Week 2 - 14 Mar 2022

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

Week 3 - 21 Mar 2022

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

Week 4 - 28 Mar 2022

Module/Topic	Chapter	Events and Submissions/Topic
Oxygen Demand and Water Pollution	10 11	**Written Assessment** Due: Week 4 Friday (1 Apr 2022) 11:45 pm AEST

Week 5 - 04 Apr 2022

Module/Topic	Chapter	Events and Submissions/Topic
Air: Stratospheric Chemistry; Ozone Hole	1 2 17	Residential School (4-5 April)

Vacation Week - 11 Apr 2022

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 18 Apr 2022

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

Week 7 - 25 Apr 2022

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

Week 8 - 02 May 2022

Module/Topic	Chapter	Events and Submissions/Topic
Air: Let There be Clean Air	3 4	**Practical and Written Assessment** Due: Week 8 Friday (6 May 2022) 11:45 pm AEST

Week 9 - 09 May 2022

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 - 16 May 2022

Module/Topic	Chapter	Events and Submissions/Topic
Energy & Climate Change: Renewable Energy, Alternative Fuels and the Hydrogen Economy	5 6 7 8	

Week 11 - 23 May 2022

Module/Topic	Chapter	Events and Submissions/Topic
Pollution: Toxic Heavy Metals and Metalloids	12	

Week 12 - 30 May 2022

Module/Topic	Chapter	Events and Submissions/Topic
Revision		

Review/Exam Week - 06 Jun 2022

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 13 Jun 2022

Module/Topic	Chapter	Events and Submissions/Topic

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 (1 Apr 2022) 11:45 pm AEST
To be submitted via Moodle.

Return Date to Students
Week 6 Friday (22 Apr 2022)
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 (6 May 2022) 11:45 pm AEST
To be submitted via Moodle.

Return Date to Students
Week 11 Friday (27 May 2022)
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 at a date to be specified.

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