



CHEM12078 *Industrial Atmospheric Emissions*

Term 2 - 2019

Profile information current as at 13/05/2024 08:21 am

All details in this unit profile for CHEM12078 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

The recent introduction of the National Clean Air Agreement by the Commonwealth, State, and Territory governments, highlights that industrial atmospheric emissions have serious environmental, public health and economic impacts. In the Industrial Atmospheric Emissions unit, you will be introduced to air pollution (both natural and industrial emissions), air pollution meteorology, monitoring, and regulation with an emphasis on practical applications in the Australian context. You will develop an understanding of atmospheric chemistry, the effects of air quality on public health and the environment, and the regulatory and management practices employed to achieve air quality goals.

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

CHEM11041 Chemistry for the Life Sciences or CHEM11043 Atoms, Molecules and Matter or GEOG12020 Australian Weather and Climate

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 - 2019

- 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. **Presentation and Written Assessment**

Weighting: 20%

2. **Written Assessment**

Weighting: 40%

3. **Examination**

Weighting: 40%

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

Design of the units Moodle site is very tablet device friendly

Recommendation

Design of units Moodle site (particularly use of 'tap and go' buttons will be maintained.

Feedback from Have Your Say

Feedback

Students felt that the residential school was of great benefit and highlighted the usefulness of interacting with industry.

Recommendation

The Chemistry team will continue their efforts to ensure a good learning experience for the students. CHEM12078 Industrial atmospheric Emissions residential school is very "real world" /industry focused. Consequently the Chemistry team would like to thank our contacts in Gladstones Industry community for their time and invaluable assistance.

Feedback from Have Your Say

Feedback

Students appreciated the timely return of assessment marks and feedback

Recommendation

The Chemistry team will continue their efforts to return feedback and marks in an appropriate time frame

Feedback from Have Your Say

Feedback

Students expressed concern that the unit was "skewed" too much towards air quality evaluation, legislation and environmental management.

Recommendation

The unit deals with the application of chemistry in real world scenarios, (be it industry or government - policy focused and thus is not solely concerned with lab based analysis). Consequently a sound knowledge of the air quality evaluation, legislation and environmental management (particularly atmospheric) is required. A greater effort will be made to communicate this information to the students in the course of their study.

Unit Learning Outcomes

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

1. Describe the nature of atmospheric pollution, the behaviour of emission plumes and the relevant meteorological determinants influencing the dispersion of emissions
2. Explain and apply Australia's current legislative framework for air quality and its regulation
3. Describe the nature of atmospheric pollutants as well as the methods for identifying emission sources
4. Identify suitable methods and discuss their application for control of emissions from point sources
5. Implement the principles of air quality audits and describe the methods available for protecting staff health
6. Report the key risks related to occupational health and safety posed by gaseous and particulate emissions in the workplace.

Potential RACI accreditation of the unit - currently in discussion with RACI














Alignment of Learning Outcomes, Assessment and Graduate Attributes

 N/A Level	 Introductory Level	 Intermediate Level	 Graduate Level	 Professional Level	 Advanced Level
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Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes							
	1		2		3	4	5	6
1 - Communication	<div></div>	<div></div>	<div></div>	<div></div>				
2 - Problem Solving			<div></div>	<div></div>				
3 - Critical Thinking	<div></div>	<div></div>	<div></div>	<div></div>				
4 - Information Literacy	<div></div>	<div></div>	<div></div>	<div></div>				
5 - Team Work								
6 - Information Technology Competence	<div></div>	<div></div>	<div></div>	<div></div>				
7 - Cross Cultural Competence				<div></div>				
8 - Ethical practice		<div></div>		<div></div>				
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 - Presentation and Written Assessment - 20%										
2 - Written Assessment - 40%										
3 - Examination - 40%										

Textbooks and Resources

Textbooks

CHEM12078

Prescribed

Air Quality

Edition: 5th (2015)

Authors: Thad Godish, Wayne T. Davis, Joshua S. Fu

CRC

Boca Raton , Florida , USA

ISBN: 978-1-4665-8444-0

Binding: eBook

Additional Textbook Information

Ebook is available to students through the CQUniversity Library and does not need to be purchased.

However, multiple user access is limited, so if you would prefer your own copy, you can purchase one 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

Aoife Power Unit Coordinator

a.power@cqu.edu.au

Shaneel Chandra Unit Coordinator

s.chandra@cqu.edu.au

Schedule

Week 1 - 15 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
Air quality issues - an overview <ul style="list-style-type: none">• Air quality management• Overview of current legislative framework	Recommended readings and activities outlined on Moodle page	

Week 2 - 22 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Pollutant characterisation and sources

- Primary and secondary pollutants
- Methods of estimating source strength
- Pollutants and sources in Central Queensland area

Recommended readings and activities outlined on Moodle page

Week 3 - 29 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
Meteorology and atmospheric turbulence <ul style="list-style-type: none"> • Introduction to the atmospheric boundary layer • Inversion types, stability and general plume • Land and sea breezes • Meteorology of the central Queensland area 	Recommended readings and activities outlined on Moodle page	

Week 4 - 05 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Plume behaviour and dispersion modelling <ul style="list-style-type: none"> • Dispersion in neutral conditions • Occurrence of neutral dispersion conditions • Dispersion in convective conditions • Dispersion in stable conditions • Dispersion in complex terrain • The influence of inversions and inversion breakup • Dispersion in central Queensland coastal conditions • Types of dispersion models 	Recommended readings and activities outlined on Moodle page	

Week 5 - 12 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Emission control - point sources (part 1) <ul style="list-style-type: none"> • Airflow in ducts • Point source emissions • Hood design • Particulate collection equipment 	Recommended readings and activities outlined on Moodle page	

Vacation Week - 19 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 26 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Emission control - point sources (part 2) <ul style="list-style-type: none"> • Gas treatment systems • Particulate disposal 	Recommended readings and activities outlined on Moodle page	

Week 7 - 02 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Emission control - area sources	Recommended readings and activities outlined on Moodle page	

Week 8 - 09 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Occupational health and safety issues (part 1)

- Gaseous pollutants and their physiological effects
- Vapours and their physiological effects
- Dusts and their physiological effects

Recommended readings and activities outlined on Moodle page

Residential School: Gladstone Marina Campus 10 - 11th September 2019

Week 9 - 16 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Occupational health and safety issues (part 2)	Recommended readings and activities outlined on Moodle page	
<ul style="list-style-type: none"> • Indoor air quality • Approaches to control 		

Week 10 - 23 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Measurement and sampling (part 1)	Recommended readings and activities outlined on Moodle page	
<ul style="list-style-type: none"> • Basic measurements • Secondary measuring tools • Calibration of equipment 		

Week 11 - 30 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Measurement and sampling (part 2)	Recommended readings and activities outlined on Moodle page	
<ul style="list-style-type: none"> • Putting it all together (an in-duct air sampling technique) • Putting it all together (an ambient air sampling technique) • Statistically valid results 		

Week 12 - 07 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic
Review		

Review/Exam Week - 14 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Exam Week - 21 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Assessment Tasks

1 Assessment Task 1: Report

Assessment Type

Presentation and Written Assessment

Task Description

This assessment task requires research outside of the units lectures and textbook. It consists of four parts:

- Part 1 involves familiarisation with the goals of the national environmental protection measures relating to ambient air quality and toxic air pollutants and preparing a concise summary of the characteristics and some known ecological/human health impacts of the regulated air pollutants.
- Part 2 involves inspecting the database available in the National Pollutant Inventory for a specific location of interest and providing a brief assessment of the available information.
- Part 3 seeks to introduce students to air quality journals and requires a brief critique of a paper of interest.

- Part 4 concerns a brief evaluation of management strategies in industry intensive regions such as Gladstone

The full details are given in the course Moodle site.

Assessment Due Date

Submit via Moodle site 11:55 PM AEST August 9th 2019

Return Date to Students

Week 6 Monday (26 Aug 2019)

Feedback will be delivered via Moodle

Weighting

20%

Minimum mark or grade

40

Assessment Criteria

General Guidelines

- The report should be coherent, have flow and there should be no typographical errors.
- Text should be word-processed, with appropriate layout and use of headings/sub-headings.
- Tables and figures to illustrate specific aspects may be included with titles and acknowledgement where necessary.
- Figures and tables should be correctly labelled. All material sourced externally must be cited in the correct format.
- The references should be listed at the end of the assessment. Please avoid images with very large file sizes as this will make your essay too large to upload/download.

The assessment task must be completed and submitted by the due date and time. In the absence of an approved extension, there will be no opportunity to complete the task after this date and there will be no supplementary exam or assessment offered should you come close to passing the unit but do not meet the criteria for a Pass grade for the overall unit.

Marking Criteria

- Detailed marking criteria will be available on the unit Moodle site, and will be based on the following:
- Clear organisation and conciseness particularly in presentation of any data (10%)
- Use of supporting data or evidence (30%)
- Sound discussion based on knowledge and understanding of scientific principles with data presented (50%)
- Evidence of use of reliable sources of information, with proper citation of any sources used (10%)

Referencing Style

- [Vancouver](#)

Submission

No submission method provided.

Learning Outcomes Assessed

- Describe the nature of atmospheric pollution, the behaviour of emission plumes and the relevant meteorological determinants influencing the dispersion of emissions
- Explain and apply Australia's current legislative framework for air quality and its regulation

Graduate Attributes

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

2 Assessment Task 2: Mini Project

Assessment Type

Written Assessment

Task Description

For this assessment task (mini-project) you are required to develop an air quality management plan to ensure for an organisations industrial site (any of your choosing) will meet its obligation under its environmental licence and ensure that goals identified in the Queensland Environmental Protection (Air) Policy 2008 (or the equivalent legislation when operating in another state/territory of Australia) and the National Environment Protection Measures (for Air Toxins and Ambient Air Quality) are not compromised by air emissions from your site.

You should aim to produce a concise report (8 - 10 pages) with technical details, as necessary, in appendices. The report should be suitable for presentation to a management meeting where it could be used to cover the main points orally in 10 minutes, but your report may be referred to for additional material. The report should be fully referenced and you are required to provide copies of any materials, which are cited that are not readily available.

Full details of the requirements for this assessment task are given in the Moodle site.

Assessment Due Date

Submit via Moodle site 11:55 PM AEST September 20th 2019

Return Date to Students

Week 12 Monday (7 Oct 2019)

Via Moodle with online feedback

Weighting

40%

Minimum mark or grade

40

Assessment Criteria

A full assessment rubrics will be available on the unit Moodle site, using the following criteria:

- The report should be coherent, have flow and there should be no typographical errors.
- Text should be word-processed, with appropriate layout and use of headings/sub-headings.
- Tables and figures to illustrate specific aspects may be included with titles and acknowledgement where necessary.
- Figures and tables should be correctly labelled. All material sourced externally must be cited in the correct format.
- The references should be listed at the end of the assessment. Please avoid images with very large file sizes as this will make your essay too large to upload/download.

The assessment task must be completed and submitted by the due date and time. In the absence of an approved extension, there will be no opportunity to complete the task after this date and there will be no supplementary exam or assessment offered should you come close to passing the unit but do not meet the criteria for a Pass grade for the overall unit.

Marking Criteria

- Supporting analysis including technical detail, clarity of expression, orderly and logical presentation (30%)
- Quality and style of technical presentation including accurate referencing of literature sources and appropriate use of figures and tables (15%)
- Demonstration of knowledge and understanding of concepts as shown by the method of analysis including evidence or research beyond own experience and course material (40%)
- Description of organisational obligations and assessment of achievement (15%)

Referencing Style

- [Vancouver](#)

Submission

No submission method provided.

Learning Outcomes Assessed

- Explain and apply Australia's current legislative framework for air quality and its regulation
- Describe the nature of atmospheric pollutants as well as the methods for identifying emission sources
- Identify suitable methods and discuss their application for control of emissions from point sources
- Implement the principles of air quality audits and describe the methods available for protecting staff health
- Report the key risks related to occupational health and safety posed by gaseous and particulate emissions in the workplace.

Graduate Attributes

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

Examination

Outline

Complete an invigilated examination.

Date

During the examination period at a CQUniversity examination centre.

Weighting

40%

Length

120 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