



# **CHEM13082 Nanotechnology: Health and the environment**

## **Term 1 - 2020**

Profile information current as at 25/04/2024 06:09 pm

All details in this unit profile for CHEM13082 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 06-04-20

The end of term examination has now been changed to an alternate form of assessment. Please see your Moodle site for details of the assessment.

Assessment 2 has now been changed to an alternate form of assessment. Please see your Moodle site for details of the assessment.

The Residential School for this unit has been postponed and you will need to complete this at a later date. Further details about the residential school will be made available on Moodle in due course.

## General Information

### Overview

Nanotechnology and nanoscience are emerging, revolutionary areas of science that will lead to exciting developments in health, medicine, the environment, information technology and engineering (among other industries). In this unit, you will become familiar with existing uses of nanotechnology along with future opportunities in the nanoscience domain. Medical and environmental applications and the development of 'emerging technologies' will be discussed and the technical, environmental and social impacts of these technological advances explored.

### Details

Career Level: *Undergraduate*

Unit Level: *Level 3*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

### Pre-requisites or Co-requisites

Pre-requisite: Successful completion of two of the following: CHEM19085 Environmental Chemistry OR CHEM12079 Non-Carbon Chemistry OR CHEM12078 Industrial Atmospheric Emissions

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 - 2020

- 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. **Practical and Written Assessment**

Weighting: 30%

#### 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 Student evaluation

##### Feedback

The word limit for the res school report should be increased to match the 30% unit weighting.

##### Recommendation

The word limit will be revised upward to 2000 words.

#### Feedback from Student evaluation

##### Feedback

There should not be an open book exam, and I think the questions should be more application based in order to demonstrate conceptual understanding

##### Recommendation

The unit exam will be closed book from 2020.

## Unit Learning Outcomes

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

1. Discuss the basic principles of nanotechnology and nanoscience
2. Evaluate and synthesise information drawn from primary literature in the field of nanotechnology
3. Discuss actual and potential impacts of nanotechnology on society, health and the environment
4. Design possible solutions to significant societal problems in health, engineering, the environment and medicine using the principles of nanoscience and nanotechnology.

Not applicable

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
<b>1 - Presentation and Written Assessment - 20%</b>	•	•	•	
<b>2 - Practical and Written Assessment - 30%</b>		•		•
<b>3 - Examination - 50%</b>	•		•	

### 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 - Presentation and Written Assessment - 20%	•			•		•				
2 - Practical and Written Assessment - 30%	•	•	•	•	•	•	•	•		
3 - Examination - 50%	•	•	•							

## Textbooks and Resources

### Textbooks

**There are no required textbooks.**

#### Additional Textbook Information

Reading materials will be accessible using the University digital database (Elsevier) from peer-reviewed journals.

### 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](mailto:s.chandra@cqu.edu.au)

## Schedule

### Week 1 - 09 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
An Introduction to Nanotechnology	Nanotechnology: The Science of the invisible	

### Week 2 - 16 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
	Past and present futures of nanotechnology	

### Week 3 - 23 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
	Particle-by-particle nanotechnology	

### Week 4 - 30 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
	Advances in food nanotechnology	

### Week 5 - 06 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
	Nanotechnology in targeted drug delivery and therapeutics	<b>Written Assessment</b> Due: Week 5 Friday (10 Apr 2020) 12:00 pm AEST

### Vacation Week - 13 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic

### Week 6 - 20 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
	The implications and applications of nanotechnology in dentistry	

### Week 7 - 27 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
	Nanoengineered biomaterials for skin regeneration	

### Week 8 - 04 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
	Multifunctional nanocomposite sensors for environmental monitoring Carbon nanomaterials and their application to electrochemical sensors	

### Week 9 - 11 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
	Green nanomaterials: On track for a sustainable future	
<b>Week 10 - 18 May 2020</b>		
Module/Topic	Chapter	Events and Submissions/Topic
	Nanoparticle-induced ecotoxicological risks in aquatic environments: Concepts and controversies	
<b>Week 11 - 25 May 2020</b>		
Module/Topic	Chapter	Events and Submissions/Topic
	Nanotechnology: Emerging health issues	
<b>Week 12 - 01 Jun 2020</b>		
Module/Topic	Chapter	Events and Submissions/Topic
		<b>Residential School Report</b> Due: Week 12 Monday (1 June 2020) 12:00 pm AEST
<b>Review/Exam Week - 08 Jun 2020</b>		
Module/Topic	Chapter	Events and Submissions/Topic
<b>Exam Week - 15 Jun 2020</b>		
Module/Topic	Chapter	Events and Submissions/Topic

## Assessment Tasks

### 1 Written Assessment

#### Assessment Type

Presentation and Written Assessment

#### Task Description

For this task, students will write a scientific review paper on a topic that will be allocated to them. The review must be formatted according to the [Author Guidelines](#) of *Analytical Chemistry*. The 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.

#### Assessment Due Date

Week 5 Friday (10 Apr 2020) 12:00 pm AEST  
Via Moodle

#### Return Date to Students

Week 7 Friday (1 May 2020)  
Marks will be provided via Moodle. Feedback will be given at the time of presentation of posters.

#### Weighting

20%

#### Minimum mark or grade

30%

#### Assessment Criteria

##### Introduction and Background: 25%

Excellent detail to highlight the present scenario.  
Very convincing argument provided for undertaking present study

##### Literature: 20%

Coherent, with excellent merge of literature

All material is sourced externally cited in the correct format  
Literature cited is recent (< 5 years), credible, relevant

**Organization: 25%**

Well-presented  
Well-positioned to reinforce the argument(s)  
Correctly labelled  
Well-organized such that patterns and themes immediately become obvious

**Analysis of the Literature: 20%**

Critical examination of literature is evident  
Demonstration of new knowledge to produce coherent understanding of the topic

**Overall Presentation: 10%**

No typos, cohesive and very easy to follow arguments

**Referencing Style**

- [Vancouver](#)

**Submission**

Online

**Submission Instructions**

Please ensure a nominated member of the group uploads the poster by the specified due date and time.

**Learning Outcomes Assessed**

- Discuss the basic principles of nanotechnology and nanoscience
- Evaluate and synthesise information drawn from primary literature in the field of nanotechnology
- Discuss actual and potential impacts of nanotechnology on society, health and the environment

**Graduate Attributes**

- Communication
- Information Literacy
- Information Technology Competence

## 2 Residential School Report

**Assessment Type**

Practical and Written Assessment

**Task Description**

Students will work in pairs during the residential school and will be using advanced analytical instrumentation to perform measurements of their work. At the end of the Residential School, each student will submit an individual summarized report of the experiments undertaken and results. Word limit: 500 words.

**Assessment Due Date**

Week 12 Monday (1 June 2020) 12:00 pm AEST

Via Moodle

**Return Date to Students**

Review/Exam Week Friday (12 June 2020)

Marks and feedback via Moodle

**Weighting**

30%

**Minimum mark or grade**

30%

**Assessment Criteria**

Demonstrated aims and objectives of each practical exercise: 30%

Critiquing and discussion of results: 50%

Formatting (including proper referencing, adhering to word limits - 2000): 20%

**Referencing Style**

- [Vancouver](#)



**Submission**

Online

**Submission Instructions**

To be submitted via Moodle

**Learning Outcomes Assessed**

- Evaluate and synthesise information drawn from primary literature in the field of nanotechnology
- Design possible solutions to significant societal problems in health, engineering, the environment and medicine using the principles of nanoscience and nanotechnology.

**Graduate Attributes**

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