CHEM13082 *Nanotechnology: Health and the environment*
Term 1 - 2023

Profile information current as at 07/05/2024 01:47 pm

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

CHEM19085 Environmental Chemistry OR CHEM12077 Food Science and Analysis OR CHEM12079 Inorganic Chemistry OR CHEM12080 Organic Chemistry
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: 40%
3. **Take Home Exam**
Weighting: 30%

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 Evaluation

Feedback

Combining the gold nanoparticles experiment with the carbon nanotube experiment may provide a bit more variety and exposure to different nanotechnology.

Recommendation

The carbon nanotube experiment will be examined for possible inclusion in the next offering of the Unit.

Feedback from Evaluation

Feedback

The tutorial sessions were a great summary in providing different light on some concepts. I really appreciated the weekly journal articles as they once again provided a different perspective and explanation, but also directly show the real world application of the topics.

Recommendation

These aspects of the Unit delivery will be retained in its next offering.

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

— 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 - 40%		•	•	•
3 - Take Home Exam - 30%	•			

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 - Written Assessment - 30%	•	•		•		•				
2 - Practical and Written Assessment - 40%	•	•	•	•	•	•		•		
3 - Take Home Exam - 30%	•	•	•							

Textbooks and Resources

Textbooks

There are no required textbooks.

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Endnote
- 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
Janice Mani Unit Coordinator
j.mani@cqu.edu.au

Schedule

Week 1 - 06 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Nanotechnology: An Introduction		

Week 2 - 13 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
History of the Nanotechnology Discipline		

Week 3 - 20 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Types of Nanoparticles		

Week 4 - 27 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Nanotechnology Applications		

Week 5 - 03 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
Nanotechnology in Drug Delivery		**Written Assessment** Due: Week 5 Friday (7 Apr 2023) 11:45 pm AEST

Vacation Week - 10 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 17 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
Nanotechnology and Public Health		

Week 7 - 24 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
Nanotechnology and COVID-19		

Week 8 - 01 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Nanocomposite-based Sensors for Environmental Applications		Residential School (2-3 May)

Week 9 - 08 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Green Nanomaterials		

Week 10 - 15 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Nanoparticles and Ecotoxicological Risks		**Practical and Written Assessment** Due: Week 10 Friday (19 May 2023) 11:45 pm AEST

Week 11 - 22 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Nanotechnology and Health		

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

Exam Week - 12 Jun 2023

Module/Topic	Chapter	Events and Submissions/Topic
		Take-home Exam Due: Exam Week Wednesday (14 June 2023) 11:45 pm AEST

Assessment Tasks

1 Written Assessment

Assessment Type
Written Assessment

Task Description
For this Assessment Task, you will write a scientific review paper on a topic that will be allocated to you. The review must be 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. In addition, the word count should not exceed 2000 (excluding references).

Assessment Due Date
Week 5 Friday (7 Apr 2023) 11:45 pm AEST
To be submitted via Moodle

Return Date to Students
Week 7 Friday (28 Apr 2023)
Returned with feedback via Moodle

Weighting
30%

Minimum mark or grade
50%

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

Organisation: 25%
Well-presented
Well-positioned to reinforce the argument(s)

Correctly labelled
Well-organised 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
To be submitted via Moodle

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
- Problem Solving
- 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. At the Residential School, you may work in pairs or groups on experiments. 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 10 Friday (19 May 2023) 11:45 pm AEST
To be submitted via Moodle

Return Date to Students
Week 12 Friday (2 June 2023)
Returned with feedback via Moodle

Weighting
40%

Minimum mark or grade
50%

Assessment Criteria
Introduction and Background: 50%
Very convincing justifications for the merits of the experiments.
Literature: 20%
Scientific literature, externally cited in the correct format to justify claims and explanations
Literature cited is recent (< 5 years), credible, relevant
Organisation: 30%
Well-positioned to reinforce the argument(s)
Correctly labelled figures and tables

Overall Presentation: 10%
No typos, cohesive and very easy to follow arguments
Word limit - 2000

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
- Discuss actual and potential impacts of nanotechnology on society, health and the environment
- 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
- Ethical practice

3 Take-home Exam

Assessment Type
Take Home Exam

Task Description
The Take Home Test will contain a mix of short-answer and longer, descriptive-answer questions. It will cover content from the teaching term, including the Residential School. The mark allocations per question will be provided on the Assessment,

Assessment Due Date
Exam Week Wednesday (14 June 2023) 11:45 pm AEST
To be submitted via Moodle

Return Date to Students

Marked scripts will be returned via Moodle at Certification of Grades.

Weighting
30%

Minimum mark or grade
50%

Assessment Criteria
The specific details of the Assessment will be provided on Moodle.
You will be assessed on correctness and completeness of answers.

Referencing Style

- Vancouver

Submission
Online

Learning Outcomes Assessed

- Discuss the basic principles of nanotechnology and nanoscience

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking

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