CHEM13082 *Nanotechnology: Health and the environment*
Term 1 - 2018

Profile information current as at 30/04/2024 01:22 pm

General Information

Overview
Nanotechnology and nanoscience are an emerging, revolutionary area of science that will lead to exciting developments in health, medicine, the environment, information technology and engineering (among other industries). In this unit, students 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: CHEM11041 Chemistry for the Life Sciences or CHEM11042 Fundamentals of 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 - 2018

- Distance
- Rockhampton

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 Have your say

Feedback

Residential schools were disruptive and not smoothly run

Recommendation

The residential timetable will be re-adjusted to suit the unit overall.

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.

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

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Communication	•	•	•	•
2 - Problem Solving		•	•	•
3 - Critical Thinking	•	•	•	•

Graduate Attributes	Learning Outcomes			
	1	2	3	4
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

CHEM13082

Prescribed

Nanoparticles in Anti-Microbial Materials: Use and Characterisation
Edition: 1 (2012)
Authors: Regan, Chapman and Sullivan
RSC Publishing
London , United Kingdom
ISBN: 978-1849731591
Binding: Hardcover
CHEM13082

Prescribed

Nanotechnology: An Introduction
Edition: 2nd edn (2016)
Authors: Ramsden, J
William Andrew Publishing
Norwich , NY , USA
ISBN: 9780323393119
Binding: Hardcover

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

Shaneel Chandra Unit Coordinator
s.chandra@cqu.edu.au

Schedule

Week 1 - 05 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
Welcome and Nanotechnology	1	

Week 2 - 12 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
The Nanoscale	2	

Week 3 - 19 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic

Forces at the Nanoscale	3	

Week 4 - 26 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
The Nano-Bio-Interface	4	**Poster Preparation** Due: Week 4 Wednesday (28 Mar 2018) 12:00 pm AEST

Week 5 - 02 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Nanometrology	5	

Vacation Week - 09 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 16 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Nanomaterials and their Production	6	

Week 7 - 23 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Nanodevices	7	

Week 8 - 30 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Nanofabrication	8	

Week 9 - 07 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Carbon-based Nanomaterials	9	

Week 10 - 14 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Nanosystems and their Design	10	Residential School starts Sunday

Week 11 - 21 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Bionanotechnology	11	Residential School continues Monday Poster displays on Monday Assessment Task 2 due before Sunday 23:59 **Research Proposal and Residential School Report** Due: Week 11 Wednesday (23 May 2018) 12:00 am AEST

Week 12 - 28 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
The Impact of Nanotechnology	12	

Review/Exam Week - 04 Jun 2018

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 11 Jun 2018

Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

Previous Student Feedback
The second assessment task was not at all well explained or supported. For a task that no one had done or seen before there should have been more support.
Response
More details will be provided regarding the assessment task.

Assessment Tasks

1 Poster Preparation

Assessment Type
Presentation and Written Assessment

Task Description
For this task your unit coordinator will assign you partners to work on a poster with. Your group should find a range of nanotechnology related research papers to inform the topic of your poster. This assessment task requires an in-depth analysis of current research outside of the course textbooks, with a focus on journal articles. Your group must present key findings and methods in the poster. The poster should be created using PowerPoint (PC) or Keynote (Mac) publishing software. Groups are reminded that posters must be concise and effective in delivering meaningful and key information, your peer groups will be expected to ask questions during the Residential School.

Assessment Due Date
Week 4 Wednesday (28 Mar 2018) 12:00 pm AEST
Powerpoint format to be emailed to unit coordinator by due date.

Return Date to Students
Week 11 Thursday (24 May 2018)
Marks will be uploaded on Moodle. Poster feedback will be during Residential School display session.

Weighting
20%

Assessment Criteria
The poster will be judged according to the following three criteria:
1. Validity and current relevance of the scientific question and findings (20%)
2. Clear communication of the ideas (20%)
3. Ability to communicate ideas verbally to the audience and answer questions (60%)

Referencing Style

- Vancouver

Submission
Offline Online Group

Submission Instructions
A powerpoint format to be uploaded by due date.

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 Research Proposal and Residential School Report

Assessment Type
Practical and Written Assessment

Task Description

1. **Research Proposal**
2. **Residential School Report**

Research Proposal
Students will individually submit a research proposal idea, including methods of analysis, project execution and budget using the following heading:
“A proposed technology or solution using nanotechnology which has the capability of solving a significant, modern health, medical or environmental problem"
The research idea will enable students to prepare and become familiar with research-based laboratory activities that will provide a framework for the development of a research idea in the discipline of nanotechnology.

Residential School Report
Students will work in pairs during the residential school and will be using advanced analytical instrumentation to perform measurements of their work.

Submission
Students will submit a summary of the practicals and chemical lab skills acquired (500 words) along with the research proposal idea (2500 words).

Assessment Due Date
Week 11 Wednesday (23 May 2018) 12:00 am AEST

Return Date to Students
Week 12 Wednesday (30 May 2018)

Weighting
30%

Assessment Criteria
Introduction and Background to the issue(s) (30%)
Excellent detail to highlight the present scenario. Very convincing argument provided for study and supported by sufficiently-detailed literature review. Demonstrated knowledge of importance and relevance of experimental work undertaken at Residential school.

Organisation (40%)
Well-presented arguments with comparisons to the literature. Literature consulted is credible, and correctly-cited. Any conclusions drawn from the Residential School activities are evidenced by sound data interpretation.

Structure, formatting and presentation (30%)
No typos, cohesive and very easy to follow arguments. The report has clarity and any numerical data presented is tabulated or graphed for maximum clarity.

Referencing Style

- Vancouver

Submission
Online

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
120 minutes

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