CHEM13082 *Nanotechnology: Health and the environment*
Term 1 - 2017

Profile information current as at 09/05/2024 02:10 am

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 - 2017

- 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 Moodle.

Feedback
Issues with exam. Some questions were poorly worded and confusing.

Recommendation
Questions will be re-phrased for the new examination.

Action
Exam was re-developed

Feedback from Moodle

Feedback
More explanation needed for research proposal especially in regards to budget requirements.

Recommendation
Assessment Task 2 will be re-designed to showcase all requirements.

Action
Examples and instructional videos were provided to support students.

Feedback from Moodle

Feedback
Book was a little disappointing

Recommendation
The learning resources need to be strengthened given the 3.3 score. The textbook selection was a little disappointing as the team found some inconsistencies in the text during lecture preparation and directed reading. We are looking to potentially remove the textbook and support the course with a small study support tool with research articles which better reflects the essence of this unit.

Action
The textbook is being swapped out and new materials are currently being developed.

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	•	•	•	•
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
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Prescribed

Nanotechnology: An Introduction
Edition: 1 (2011)
Authors: Jeremy Ramsden
Elsevier
Oxford , United Kingdom
ISBN: 978-0-08-096447-8
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: Turabian
For further information, see the Assessment Tasks.

Teaching Contacts

James Chapman Unit Coordinator
j.chapman@cqu.edu.au

Schedule

Week 1 - 06 Mar 2017

Module/Topic	Chapter	Events and Submissions/Topic
1) Introduction to Nanoscience	1	

Week 2 - 13 Mar 2017

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

Week 3 - 20 Mar 2017

Module/Topic	Chapter	Events and Submissions/Topic

3) Forces at the Nanoscale	3	

Week 4 - 27 Mar 2017

Module/Topic	Chapter	Events and Submissions/Topic
4) The Nano/Bio Interface	4	

Week 5 - 03 Apr 2017

Module/Topic	Chapter	Events and Submissions/Topic
5) Introduction to Nanomedicine	5	

Vacation Week - 10 Apr 2017

Module/Topic	Chapter	Events and Submissions/Topic
		Poster Presentation Due: Vacation Week Monday (10 Apr 2017) 11:45 pm AEST

Week 6 - 17 Apr 2017

Module/Topic	Chapter	Events and Submissions/Topic
6) Nanomaterials	6	

Week 7 - 24 Apr 2017

Module/Topic	Chapter	Events and Submissions/Topic
7) Nanomaterials for disease destruction	7	

Week 8 - 01 May 2017

Module/Topic	Chapter	Events and Submissions/Topic
8) Nanodevices	8	

Week 9 - 08 May 2017

Module/Topic	Chapter	Events and Submissions/Topic
9) Bio-nanotechnology	9	

Week 10 - 15 May 2017

Module/Topic	Chapter	Events and Submissions/Topic
10) Nano-facture	10	

Week 11 - 22 May 2017

Module/Topic	Chapter	Events and Submissions/Topic
11) The impact of nanotechnology	11	

Week 12 - 29 May 2017

Module/Topic	Chapter	Events and Submissions/Topic
Research Topics and Exam Preparation	All Chapters	**Research Proposal** Due: Week 12 Monday (29 May 2017) 11:45 pm AEST

Review/Exam Week - 05 Jun 2017

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 12 Jun 2017

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Poster Presentation

Assessment Type
Presentation and Written Assessment

Task Description

In a group of 2, research, design and produce an A0 sized research poster on a topic of your interest in the field of nanotechnology.

For this task your course coordinator will assign you a partner. 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. Full details of the assessment task including examples of posters are provided on the course Moodle page.

Assessment Due Date
Vacation Week Monday (10 Apr 2017) 11:45 pm AEST
Individual electronic submissions of the group poster should be submitted to Moodle as a .pptx, .ppt or .key file only

Return Date to Students
Week 6 Friday (21 Apr 2017)
Feedback will be given on Moodle

Weighting
20%

Minimum mark or grade
40%

Assessment Criteria
An A0 printed copy of the poster will be displayed during the residential school. The poster will be printed by the course coordinator. The posters will be given peer review critique and graded using the following criteria:

- Clear organisation and presentation of the material, conciseness and ability to clearly present the argument/topic (30%)
- Presentation (30%)
- Use of relevant and reliable sources of information, including ability to cite (20%)
- Peer grading of group effort, anonymised. (20%)

Referencing Style

- Turabian

Submission
Offline Online Group

Submission Instructions
Individual student submission of the electronic version of the poster must be submitted through Moodle; pptx, ppt or .key (Mac) submissions

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

Assessment Type
Practical and Written Assessment

Task Description
Students will individually submit a research proposal idea, including methods of analysis, project execution and budget using the following heading:

"Using Nanotechnology, propose a technology or solution 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. Students will work in pairs during the residential school and will be using advanced analytical instrumentation to perform measurements of their work. Students will submit a **summary of the practicals and chemical lab skills acquired** (500 words) along with a **research proposal idea** (2500 words).
Further information related to this task can be accessed via the Assessment Task 2 link on the course Moodle page.

Assessment Due Date
Week 12 Monday (29 May 2017) 11:45 pm AEST

Return Date to Students
Monday (5 June 2017)
Feedback will be given through Moodle

Weighting
30%

Minimum mark or grade
40%

Assessment Criteria
Residential School Summary Report:

- Concise results of all practicals (10%)
- List of new lab skills/ techniques acquired (10%)

Research Proposal:

- Background to the problem (5%)
- Presentation of research idea (10%)
- Impact of the proposed idea (25%)
- Scientific methodology and approach to solving the problem (25%)
- Budget (10%)
- References (5%)

Further information related to this task can be accessed via the Assessment Task 2 link on the course Moodle page.

Referencing Style

- Turabian

Submission
Online

Submission Instructions
Online submission in Moodle (docx doc and rtf only submissions)

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
Calculator - all non-communicable calculators, including scientific, programmable and graphics calculators are authorised
Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).

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