CHEM13082 *Nanotechnology: Health and the environment*

Term 1 - 2019

Profile information current as at 12/10/2024 06:35 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.

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 - 2019

- Mixed Mode
- 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).

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 Unit Evaluation

Feedback
Students have highlighted the textbook Nanoparticles in Anti-Microbial Materials: Use and Characterisation listed on the Unit Profile as not being useful.

Recommendation
Nanoparticles in Anti-Microbial Materials: Use and Characterisation will be removed from the list of textbooks.

Feedback from Unit Evaluation

Feedback
The lab manual was seen to be hard to follow.

Recommendation
The experiments in the lab manual will be improved to make them more clear.

Feedback from Unit Evaluation

Feedback
The textbook (Nanotechnology: An Introduction) is not very clear in its explanations.

Recommendation
The Ramsden textbook (Nanotechnology: An Introduction) will be replaced with another (to be identified) to meet the needs of the Unit and suit the background of our students (many of who have not done Physics at high school).

Feedback from Unit Evaluation and Moodle Forum

Feedback
The complexity of the research proposal aspect of the second assessment task has been highlighted.

Recommendation
The second assessment task on research proposal writing will be simplified to to remove any expectation of projected expenses and research team. This will ensure students are able to understand its requirements better.

Feedback from Unit Evaluation and anecdotal feedback

Feedback
Students have commented that teamwork was not effective in some instances, with group members not sharing the workload equally.

Recommendation
A Self and Peer Assessment component will be introduced as part of the group assessment task to better reflect and measure student input in each group.

Feedback from Course review and discussions with Medical Sciences.

Feedback
Students would benefit from completing a second-year unit before enroling in CHEM13082.

Recommendation
In the future, appropriate proposals will be developed to swap the delivery of CHEM13082 with CHEM12078. If successful, this change will result in CHEM13082 being offered in Term 2, and CHEM12078 in Term 1. Thus, CHEM12078 can be a relevant second-year unit available to students which will strengthen their chemistry background before enroling in CHEM13082.

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

There are no required textbooks.

Additional Textbook Information
A list of peer-reviewed papers and book chapters, available for free download will serve as reading materials.

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
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Schedule

Week 1 - 11 Mar 2019

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

Week 2 - 18 Mar 2019

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

Week 3 - 25 Mar 2019

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

Week 4 - 01 Apr 2019

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

Week 5 - 08 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
	Nanotechnology in targeted drug delivery and therapeutics	

Vacation Week - 15 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 22 Apr 2019

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

Week 7 - 29 Apr 2019

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

Week 8 - 06 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
	Multifunctional nanocomposite sensors for environmental monitoring Carbon nanomaterials and their application to electrochemical sensors	**Group Poster** Due: Week 8 Wednesday (8 May 2019) 5:00 pm AEST

Week 9 - 13 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
	Green nanomaterials:On track for a sustainable future	

Week 10 - 20 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
	Nanoparticle-induced ecotoxicological risks in aquatic environments: Concepts and controversies	

Week 11 - 27 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
	Nanotechnology: Emerging health issues	Residential School: 28-29 May

Week 12 - 03 Jun 2019

Module/Topic	Chapter	Events and Submissions/Topic
		Residential School Report Due: Week 12 Wednesday (5 June 2019) 5:00 pm AEST

Review/Exam Week - 10 Jun 2019

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 17 Jun 2019

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Group Poster

Assessment Type
Presentation and Written Assessment

Task Description
For this task you will sign-up in groups of 4 to work on a poster. Your group should find a range of nanotechnology related research papers to inform the topic. This assessment task requires an in-depth analysis of current research focussing 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.
Once the posters have been submitted on Moodle, they will be printed for you. On the second day of the Residential School, you will present these posters as a group to scientists and peers at the University. As this is a group activity, there will also be a self and peer assessment component in the assessment task. The total marks awarded will be 50% of the group mark for the poster + 50% SPA.

Assessment Due Date
Week 8 Wednesday (8 May 2019) 5:00 pm AEST

Via Moodle

Return Date to Students
Week 12 Friday (7 June 2019)

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
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
Online

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

assessmentOutcome

- 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

assessmentGradAttribute

- 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 summarised report of the experiments undertaken and results. Word limit: 500 words.

Assessment Due Date
Week 12 Wednesday (5 June 2019) 5:00 pm AEST

Return Date to Students
Review/Exam Week Wednesday (12 June 2019)

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): 20%

Referencing Style

- Vancouver

Submission
Online

Submission Instructions
To be submitted via Moodle

assessmentOutcome

- 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.

assessmentGradAttribute

- 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
Open 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

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assessmentOutcome

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assessmentGradAttribute

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