



# OCHS12018 Safety Science

## Term 1 - 2019

Profile information current as at 24/04/2024 02:38 am

All details in this unit profile for OCHS12018 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

This unit will help you make the connection between science and safety so that you will think scientifically to promote evidence-based safety practice. You will be introduced to the science that explains how hazards behave, the concept of energy conversion and how hazards cause harm. Management of health and safety risk is discussed from an evidence-informed perspective. Case studies will be used to assist you in developing an appreciation of the linkages between the causation of harm and fundamental theories of physics, chemistry, physiology and social sciences.

### Details

Career Level: *Undergraduate*

Unit Level: *Level 2*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

### Pre-requisites or Co-requisites

Pre-requisite study of 24 credit points

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

- Adelaide
- Brisbane
- Bundaberg
- Gladstone
- Mackay
- Melbourne
- Online
- Perth
- Rockhampton
- Sydney

### 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. **Online Quiz(zes)**

Weighting: 40%

#### 2. **Case Study**

Weighting: 30%

#### 3. **Written Assessment**

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 Staff reflection

##### Feedback

Assessments should be significantly restructured to better assess understanding of learning material and underpin the learning objectives for this unit.

##### Recommendation

Consultation with teaching staff should culminate in a unit change proposal for future offerings of this unit.

#### Feedback from Unit evaluation responses and feedback

##### Feedback

Students appreciated the support provided by the presence of multiple staff on the teaching team for this unit.

##### Recommendation

Where possible, the unit can be strengthened by the expertise and involvement of multiple lecturers/tutors or a combination of lecturers and the coordinator.

## Unit Learning Outcomes

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

1. Describe the scientific nature of hazards
2. Explain the principles of energy conversion as it applies to health and safety risk
3. Apply scientific principles to explain fatality, injury, illness and harm
4. Utilise scientific research to improve health and safety outcomes
5. Analyse the utility and practicality of risk controls in a structured and scientific manner.

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
1 - Case Study - 30%	•	•	•	•	
2 - Written Assessment - 30%			•	•	•
3 - Online Quiz(zes) - 40%	•	•			•

### Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
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 - Case Study - 30%	•	•	•	•		•				
2 - Written Assessment - 30%	•	•	•	•	•	•	•		•	
3 - Online Quiz(zes) - 40%		•	•			•				

## 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)

## Referencing Style

All submissions for this unit must use the referencing style: [Harvard \(author-date\)](#)  
 For further information, see the Assessment Tasks.

## Teaching Contacts

**Shevaun Dell** Unit Coordinator  
[s.dell@cqu.edu.au](mailto:s.dell@cqu.edu.au)

## Schedule

### Week 1 - 11 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Introduction to OCHS12018 Safety Science	Readings will be made available in Moodle	Introduce yourself in the Week One 'Introduce Yourself' forum so we know you can access the unit Moodle site.

### Week 2 - 18 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Underpinning Scientific Concepts of Safety I	Readings will be made available in Moodle	<b>Quiz 1</b> opens Friday 22nd March

### Week 3 - 25 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Underpinning Scientific Concepts of Safety II	Readings will be made available in Moodle	<b>Quiz 2</b> opens Friday 29th March

### Week 4 - 01 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Physical and Mechanical Hazards	Readings will be made available in Moodle	<b>Quiz 1</b> closes Friday 5th April <b>Quiz 3</b> opens Friday 5th April

### Week 5 - 08 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Noise and Vibration	Readings will be made available in Moodle	<b>Quiz 2</b> closes Friday 12th April <b>Quiz 4</b> opens Friday 12th April

### Vacation Week - 15 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
		<b>Quiz 3</b> closes Friday 19th April

### Week 6 - 22 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Light and Radiation	Readings will be made available in Moodle	<b>Quiz 4</b> closes Friday 26th April <b>Quiz 5</b> opens Friday 26th April <b>Case Study Analysis</b> Due: Week 6 Friday (26 Apr 2019) 11:59 pm AEST

### Week 7 - 29 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Electrical Hazards	Readings will be made available in Moodle	<b>Quiz 6</b> opens Friday 3rd May

### Week 8 - 06 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Chemical Hazards I	Readings will be made available in Moodle	<b>Quiz 5</b> closes Friday 10th May <b>Quiz 7</b> opens Friday 10th May

### Week 9 - 13 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Lecture: Chemical Hazards II	Readings will be made available in Moodle	<b>Quiz 6</b> closes Friday 17th May <b>Quiz 8</b> opens Friday 17th May
<b>Week 10 - 20 May 2019</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Lecture: Biological Hazards	Readings will be made available in Moodle	<b>Quiz 7</b> closes Friday 24th May <b>Quiz 9</b> opens Friday 24th May  <b>Group Report</b> Due: Week 10 Friday (24 May 2019) 11:59 pm AEST
<b>Week 11 - 27 May 2019</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Lecture: Psychosocial Hazards	Readings will be made available in Moodle	<b>Quiz 8</b> closes Friday 31st May <b>Quiz 10</b> opens Friday 31st May
<b>Week 12 - 03 Jun 2019</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Lecture: Recap	Readings will be made available in Moodle	<b>Quiz 9</b> closes Friday 7th June
<b>Review/Exam Week - 10 Jun 2019</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
		<b>Quiz 10</b> closes Friday 14th June
<b>Exam Week - 17 Jun 2019</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>

## Assessment Tasks

### 1 Online Quizzes

#### Assessment Type

Online Quiz(zes)

#### Task Description

For this assessment you will be required to complete 10 online quizzes, each assessing your understanding of the learning materials from a different week. Quizzes will cover the material from weeks 2 to 11.

It is important that quizzes are completed in a timely manner following each topic, so each quiz will be open for two weeks only. Each quiz will open on the Friday of the relevant week, and close on the Friday two weeks later. (For example, the first quiz will open on Friday of week 2 and close on Friday of week 4.)

#### Number of Quizzes

#### Frequency of Quizzes

Weekly

#### Assessment Due Date

Quizzes will close on Friday at 11.55pm two weeks after they open.

#### Return Date to Students

Feedback will be available following closure of each quiz.

#### Weighting

40%

#### Assessment Criteria

Each quiz is worth 4% of your overall mark for this unit. Marks will be awarded for correct answers.

#### Referencing Style

- [Harvard \(author-date\)](#)

## Submission

Online

## Learning Outcomes Assessed

- Describe the scientific nature of hazards
- Explain the principles of energy conversion as it applies to health and safety risk
- Analyse the utility and practicality of risk controls in a structured and scientific manner.

## Graduate Attributes

- Problem Solving
- Critical Thinking
- Information Technology Competence

## 2 Case Study Analysis

### Assessment Type

Case Study

### Task Description

The purpose of this assignment is to demonstrate that you can apply scientific principles to explain the process that resulted in damage or harm. You will be presented a list of case studies that involve various forms of energy. You are required to select and analyse three case studies from the list. Your three selected case studies must feature a different energy form.

Using the energy-damage model, each analysis must:

- Identify the selected case study
- Identify the form of energy immediately before control was lost
- Identify preconditions that make the event possible
- Describe the hazard control failure mechanism
- Describe the point in time that relates to the damage event
- Identify the space transfer mechanism
- Describe the energy transference that led to damage
- Identify the assets damaged (recipients)
- Identify the damage threshold of the recipients

Students are more likely to be successful with submissions of 300-500 words per case study.

Referencing is not required for this assessment, but if you choose to utilise additional resources they should be referenced in accordance with Harvard Style.

### Assessment Due Date

Week 6 Friday (26 Apr 2019) 11:59 pm AEST

### Return Date to Students

Week 8 Friday (10 May 2019)

### Weighting

30%

### Assessment Criteria

Your submission will be assessed against the following criteria:

#### Each case study analysis (10 marks)

Depth of analysis and level of accuracy for the following:

- Identify the selected case study (1 mark)
- Identify the form of energy immediately before control was lost (1 mark)
- Identify preconditions that make the event possible (1 mark)
- Describe the hazard control failure mechanism (2 marks)
- Describe the point in time that relates to the damage event (1 mark)
- Identify the space transfer mechanism (1 mark)
- Describe the energy transference that led to damage (1 mark)
- Identify the assets damaged (recipients) (1 mark)
- Identify the damage threshold of the recipients (1 mark)

### Referencing Style

- [Harvard \(author-date\)](#)

## Submission

Online

## Submission Instructions

Submissions must be in Word or PDF format.

## Learning Outcomes Assessed

- Describe the scientific nature of hazards
- Explain the principles of energy conversion as it applies to health and safety risk
- Apply scientific principles to explain fatality, injury, illness and harm
- Utilise scientific research to improve health and safety outcomes

## Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence

## 3 Group Report

### Assessment Type

Written Assessment

### Task Description

The purpose of this assignment is to demonstrate application of evidence-informed thinking in regards to the management of a safety science problem.

This is a team assignment (up to 3 members). You can form your own teams. If you are not in a team by Monday of week 4, you will be assigned to a team.

### Case Study

Whites Petroleum Company has recently acquired a Liquid Petroleum Gas (LPG) storage and transfer facility that was founded in 1965. Due to past events, the managers of Whites Petroleum are aware that there is potential for Boiling Liquid Expanding Vapour Explosions (BLEVEs) in this industry. As a safety consultant, you have been asked to explain why and how BLEVEs may occur and to recommend intervention strategies that are practical, cost-effective, and specific to the LPG industry. The interventions you recommend need to be based on scientific principles.

Present your recommendations in the form of a summary report to the company. In your response, you should include:

1. A review of the literature relating to BLEVEs, including a summary of:

- The conditions under which BLEVEs can occur
- The chemical and physical properties of LPG
- The potential for secondary fires and explosions following a BLEVE
- Available risk control measures
- Evidence from research in the field

2. A discussion of the merits of various interventions

3. Your considered opinion concerning the most appropriate intervention(s), based on the evidence you have reviewed

4. Your recommendations for implementing your chosen intervention strategy/strategies

Submissions of 1500-2000 words are more likely to be successful.

Each team member must also submit a Self and Peer Assessment using the tool provided via Moodle.

### Assessment Due Date

Week 10 Friday (24 May 2019) 11:59 pm AEST

### Return Date to Students

Week 12 Friday (7 June 2019)

### Weighting

30%

### Assessment Criteria

Your submission will be assessed against the following criteria:

Introduction (2 marks)

- The intervention you will argue for
- The direction the submission will follow



#### Analyse of BLEVEs in the LPG industry (7 marks)

- The conditions under which BLEVEs can occur
- The potential for secondary fires and explosions
- The chemical and physical properties of LPG
- Lessons learned
- Interventions (control measures) available

#### Discussion (8 Marks)

- Merits of various interventions
- Consideration of hierarchies of control, practicality and cost-benefit
- Your opinion based on reputable and credible evidence
- Depth of discussion

#### Recommendations for action (4 marks)

- Clear and to the point
- Suitable implementation (action plan) for the intervention(s) recommended

#### Conclusion (2 marks)

- Implications of your recommended intervention(s)
- Includes no new information
- Draws to a logical end

#### Argument is persuasive (2 marks)

- Makes logical connections between evidence, opinion and recommendations
- Written expression is concise and precise
- Format, grammar and spelling support readability

#### References (2 marks)

- Consistent with Harvard Style (located in the unit profile)
- Contains at least 10 reputable references, 4 of which are peer-reviewed journal articles

#### Team participation (3 marks)

- Communication
- Commitment
- Contribution

#### Referencing Style

- [Harvard \(author-date\)](#)

#### Submission

Online Group

#### Submission Instructions

Submissions must be in Word or PDF format.

#### Learning Outcomes Assessed

- Apply scientific principles to explain fatality, injury, illness and harm
- Utilise scientific research to improve health and safety outcomes
- Analyse the utility and practicality of risk controls in a structured and scientific manner.

#### Graduate Attributes

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

## 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