



OCHS13019 *Prevention Through Design*

Term 3 - 2019

Profile information current as at 05/05/2024 08:57 pm

All details in this unit profile for OCHS13019 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

You will develop competence and confidence in using prevention through design (PtD) strategies and tools. PtD, or 'safe design', is a process of hazard identification and risk assessment to eliminate or minimize risk of injury and anticipate failure modes throughout the life of the product or system. You will be given the knowledge needed to optimise human performance and enhance safety in a socio-technical environment. Topics include safe design principles, optimisation of the design process, life cycle analysis, hazard and operability studies, Fault Tree Analysis, Failure Modes and Effect Analysis and strategic design risk assessment using the Safety Case. There is an emphasis on human factors engineering, the principles of technology adoption and consideration of the notion of disruptive technologies.

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:- 72 credit points including successful completion of AINV11002 and either OCHS13008 or OCHS12019

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 3 - 2019

- Online

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. **Portfolio**

Weighting: 50%

2. **Group Work**

Weighting: 20%

3. **Presentation and 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 Student feedback

Feedback

Students indicated that they did not like the group assessment.

Recommendation

Removal of the requirements for group work in Assessment 2 will be considered.

Unit Learning Outcomes

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

1. Appraise design as an effective strategy to minimise injuries, illnesses and fatalities.
2. Evaluate designs from a life cycle approach.
3. Identify past and present opportunities and challenges to achieving 'prevention through design' including the design process, human factors engineering, adoption of new technology and impact of disruptive technologies.
4. Evaluate potential risks associated with design issues in socio-technical systems around culture, processes, structures, equipment, tools and people by employing appropriate analytical methods.
5. Assess the value of the elimination of hazards through the redesign of buildings and structures, work environments, materials, plant (machinery and equipment) job tasks and work environments.
6. Create a systematic response to a design problem that incorporates the prevention through design principles and methods.
7. Appraise design sub-optimisation and plant operational parameters as a member of a safety case design team

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes						
	1	2	3	4	5	6	7
1 - Portfolio - 50%		•	•	•		•	•
2 - Group Work - 20%	•	•	•	•			
3 - Presentation and Written Assessment - 30%		•	•	•	•		

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
1 - Communication	•	•	•	•	•	•	

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
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 - Portfolio - 50%	•	•	•	•	•	•	•	•		
2 - Group Work - 20%	•	•	•	•	•	•	•	•		
3 - Presentation and Written Assessment - 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)

Referencing Style

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

Teaching Contacts

David Skegg Unit Coordinator
d.skegg@cqu.edu.au

Schedule

Week 1 - Introduction - 11 Nov 2019

Module/Topic	Chapter	Events and Submissions/Topic
Video Lecture 1: Introduction to the topic of Prevention through Design (PtD), Learning Outcomes, Moodle and Assessments.		
Video Lecture 2: The meaning of 'Prevention' and 'Safety' in PtD. <ul style="list-style-type: none">• Does prevention = safety?• What is the place of risk assessments using likelihood and consequence?	Prescribed reading will be provided on Moodle.	

Week 2 - Asset Life Cycles - 18 Nov 2019

Module/Topic	Chapter	Events and Submissions/Topic
Video Lecture: Asset life cycles and the opportunities for design intervention throughout the life cycle.	Prescribed reading will be provided on Moodle.	

Week 3 - Design Assessment - 25 Nov 2019

Module/Topic	Chapter	Events and Submissions/Topic
Video Lecture: Systematic investigation of a design to assess its safety.	Prescribed reading will be provided on Moodle.	Assessment 1 - Case 1 case study is due Friday 11:59pm AEST.

Week 4 - Case Studies - 02 Dec 2019

Module/Topic	Chapter	Events and Submissions/Topic
Video Lecture: Case studies in PtD. <ul style="list-style-type: none">• understanding the impact that PtD can have and how its absence leads to failure.• reflection upon the impact of PtD through exploring the limitations and benefits of autonomous car design	Prescribed reading will be provided on Moodle.	

Vacation Week - 09 Dec 2019

Module/Topic	Chapter	Events and Submissions/Topic
Vacation week		

Week 5 - Safety Case - 16 Dec 2019

Module/Topic	Chapter	Events and Submissions/Topic
Video Lecture: How we can manage 'risk' in design. <ul style="list-style-type: none">• The Safety Case This will inform your group task - Assessment 2.	Prescribed reading will be provided on Moodle.	Assessment 3 Part A is due Monday at 10am AEST.

Week 6 - Risk Assessment in design - 23 Dec 2019

Module/Topic	Chapter	Events and Submissions/Topic
Video Lecture: Using advanced risk assessment in achieving PtD.	Prescribed reading will be provided on Moodle.	Assessment 1 - Case 2 case study is due Friday 11:59pm AEST.

Week 7 - Achieving Prevention Through Design (PtD) - 06 Jan 2020

Module/Topic	Chapter	Events and Submissions/Topic
Video Lecture: How we can achieve 'prevention' in design.	Prescribed reading will be provided on Moodle.	Assessment 2 due this Sunday 11:59pm AEST

Week 8 - Achieving Prevention Through Design (PtD) continued - 13 Jan 2020

Module/Topic	Chapter	Events and Submissions/Topic
Video Lecture: How we can achieve 'prevention' in design? (continued)	Prescribed reading will be provided on Moodle.	

Week 9 - Risk in Design - 20 Jan 2020

Module/Topic	Chapter	Events and Submissions/Topic
Video Lecture: How we can manage 'risk' in design?	Prescribed reading will be provided on Moodle.	Assessment 1 - Case 3 case study is due Friday 11:59pm: AEST

Week 10 - Risk in Design continued - 27 Jan 2020

Module/Topic	Chapter	Events and Submissions/Topic
Video Lecture: How we can manage 'risk' in design (continued) • HAZOP, and • FMECA	Prescribed reading will be provided on Moodle.	

Week 11 - Managing Risk in design continued - 03 Feb 2020

Module/Topic	Chapter	Events and Submissions/Topic
Video Lecture: How we can manage 'risk' in design (continued) • Control room design • Maintenance strategies design	Prescribed reading will be provided on Moodle.	

Week 12 - Reflection and Review - 10 Feb 2020

Module/Topic	Chapter	Events and Submissions/Topic
Tutorial. Review and reflection.		Assessment 3 Part B is due on Tuesday at 10am AEST

Exam Week - 17 Feb 2020

Module/Topic	Chapter	Events and Submissions/Topic
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Assessment Tasks

1 Achieving Design Standards

Assessment Type

Portfolio

Task Description**Purpose**

The purpose of this assignment is to gain experience and demonstrate your ability to evaluate the application of design controls (based upon controls described in the lectures and of the nature and apparent adequacy of the organisational, social or legislative arrangements that give rise to the design controls).

This assessment requires you to be inquisitive and investigative. You will also need to demonstrate some lateral thinking.

Task Description

For any two of the cases provided to you in Moodle plus an additional one case that you bring to this exercise, find out for each of your three cases:

- why is it important for there to be a design standard for this sociotechnical system or activity
- if design standards exist

- what they are (document name(s))
- what organisation develops them
- whether development is informed by both reactive and proactive methods (if you can discover or deduce the answer)
- whether the standards are adhered to
- whether the standards are appropriate to drive the desired and required design outcomes
- the means used in society to promulgate awareness and encourage or enforce their use during design and operations.

For each case, you will be researching and reflecting to a greater depth.

You are required to:

1. Complete your case studies progressively throughout the Unit (Wk 3, Wk 6, Wk 9).
2. Document the status of the design standards implementation

- what design standards exist,
- what they are (document name(s))
- what organisation develops them

3. Reflect upon the findings and, with further research, then document

- whether development is informed by both reactive and proactive methods (if you can discover the answer)
- the means used in society to promulgate and encourage or enforce their use
- effectiveness of the controls
 - adequacy of the scope
 - inclusion of good controls
 - strengths
 - weaknesses
 - effectiveness
 - review following technology change
 - any additional observations.

Assessment Due Date

Submit your case studies progressively through Moodle. Case 1 - Week 3; Case 2 - Week 6; Case 3 - Week 9.

Return Date to Students

Feedback will be provided within 2 weeks of submission.

Weighting

50%

Assessment Criteria

There are three cases worth 10% (1st case - 1,000 words), 15% (2nd case - 1,500 words) and 25% (3rd case - 2,500 words) for a total tally of 50%. The grading for each case will reflect a greater depth of research and reflection and will be assessed on:

- Depth of research undertaken: what did you do (10%)
- Explanation of the process of development of standards, promulgation and enforcement: what did you find out (20%)
- Observations, analysis and commentary: what does this mean (70%)

In assessing the work, value will be placed on the quality and clarity of the written word, on logic, on the accurate use of technical terms and on the quality of analytical thought and comment.

Tabulating the key findings can simplify the presentation of your factual evidence.

Further guidance will be provided through Moodle.

Referencing Style

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

Submission

Online

Submission Instructions

Submit as one Word or pdf file. Submission must be readable by Turnitin.

Learning Outcomes Assessed

- Evaluate designs from a life cycle approach.
- Identify past and present opportunities and challenges to achieving 'prevention through design' including the design process, human factors engineering, adoption of new technology and impact of disruptive technologies.
- Evaluate potential risks associated with design issues in socio-technical systems around culture, processes, structures, equipment, tools and people by employing appropriate analytical methods.
- Create a systematic response to a design problem that incorporates the prevention through design principles and methods.
- Appraise design sub-optimisation and plant operational parameters as a member of a safety case design team

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence
- Cross Cultural Competence
- Ethical practice

2 Team Design Project

Assessment Type

Group Work

Task Description

Task Description

The purpose of this project is to gain experience and demonstrate your ability in appraising a new and emerging design issue.

Students will conduct a group (team) design project. The project will mirror the research and decision activities that are necessary to successfully solve societal design problems. The team will appraise an existing design of an emerging complex sociotechnical system using the safety case methodology.

The design assessment must include:

- consideration of the whole life cycle of the object whose design is being evaluated;
- evidence of the use of a suitable structured analytical approach to the consideration of safety design requirements;
- comment on the effectiveness of the design strategies adopted; and
- make any appropriate observations about social, organisational or cultural assumptions on which you believe the design effectiveness depends.

Teams. A team will consist of three to five students. Students will be allocated into teams in Week 4.

You are required to:

1. Choose your topic from the following list (only one team per topic- first team to nominate their preference takes the topic):

- interfacing in a world where there is a partial introduction of autonomous vehicles into our existing road network
- search and rescue using drones
- replacement of a delivery system with drone technology
- automation of intermodal transport systems etc
- road design for autonomous vehicles,
- replacement of commuter trains with fast or very fast rail
- remote surgery using robotics
- construction of intercity transport network that separates light and heavy vehicles
- development of a new hospital emergency triage to reduce doctor and bed capacity requirements

2. Hold team meetings to develop a shared understanding across the team of the topic and issues posed.

3. Develop a safety case formal report for the proposed new technology, prepared in accordance with WHS Regulations (Qld), chapter 9,

4. Support the argument for the safety case with evidence based practice (CQUni Harvard Referencing)

5. Address the following PtD criteria within your Safety Case:

- PtD design principles

- consideration of any potential trade-offs to minimise sub-optimisation of subsystems.
- risk assessments for key sub-systems

6. Upload the work that you have contributed to the group and your self and peer review.

Assessment Due Date

Detailed description is on the Moodle site

Return Date to Students

Assessments will be returned within 3 weeks of the due date.

Weighting

20%

Assessment Criteria

Your submission will be assessed on the depth to which you have addressed the following:

- safety case developed in accordance with WHS Regs Ch 9
- the identification conducted under section 554, including a list of all major incidents identified (or postulated)
- the safety assessment conducted under section 555
- the major hazard facility's emergency plan
- the major hazard facility's safety management system
- description of any arrangements made in relation to the security of the major hazard facility
- that the major hazard facility's safety management system will, once implemented, control risks arising from major incidents and major incident hazards
- the adequacy of the measures to be implemented by the operator to control risks associated with the occurrence and potential occurrence of major incidents
- consideration of the whole life cycle of the Sociotechnical system
- shows evidence of the use of a suitable structured analytical approach to the consideration of safety design requirements and comment on the design strategy
- logic, accurate use of technical terms, the quality of analytical thought and comment.

Marks will also be allocated to the following:

- adherence to topic agreed by the lecturer
- cover sheet & team contract supplied
- formatted in a formal report style with contents list, numbered para headings, page numbering etc as described in Moodle
- demonstrated individual contribution: the work that you have contributed to the group and your self and peer review.

Further details will be provided in the grading rubric in Moodle.

Referencing Style

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

Submission

Online Group

Submission Instructions

Written assignment submitted in one document. Submission must be readable by Turnitin.

Learning Outcomes Assessed

- Appraise design as an effective strategy to minimise injuries, illnesses and fatalities.
- Evaluate designs from a life cycle approach.
- Identify past and present opportunities and challenges to achieving 'prevention through design' including the design process, human factors engineering, adoption of new technology and impact of disruptive technologies.
- Evaluate potential risks associated with design issues in socio-technical systems around culture, processes, structures, equipment, tools and people by employing appropriate analytical methods.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking

- Information Literacy
- Team Work
- Information Technology Competence
- Cross Cultural Competence
- Ethical practice

3 Learning Journal

Assessment Type

Presentation and Written Assessment

Task Description

We are living in an exciting time of social and technological change. As future safety managers, you will help to usher in an as yet unknown and exciting new future. We have the opportunity and responsibility to contribute to the designs of this new future and prevent the inadvertent introduction of problems and sociotechnical design failures.

The purpose of this project is to provide you with an opportunity to assimilate and reflect on the subject matter of this unit, your experiences in contributing to the group and other learnings about how PtD can be applied. It is an opportunity for you to personally consider the meaning and practice of each of the learning outcomes that you will find in the Unit Outline.

Task Description

You will maintain a personal journal during the term. This is not an essay, it is a personal learning journal of your own reflections and learnings. Make journal notes in support of your work and reflections (thoughts and feelings) as they arise.

The journal may be written in the first person. Submissions should be in MSWord or pdf format that is readable by TurnItIn. Further guidance on the format will be provided through Moodle.

As a guide you should aim to submit one to two pages per learning week.

CQUni Harvard referencing is required.

Complete both Part A and Part B.

PART A (20%) Weeks 1-3 due Week 5.

You are required to:

1. Reflect on and describe the subject content and readings to make at least one substantive entry each week.
2. Reflect and comment upon the history of the emphasis on PtD, the support for it in legislation, Standards and Codes of Practice and consideration of the range of design areas seen as requiring attention.
3. Reflect on the Weekly tasks that are posed in the lectures and on Moodle and how they impacted on your awareness of PtD issues.

PART B (80%) Weeks 4-11 due Week 12

You are required to:

1. Reflect on the subject content and readings to understand the topic and make at least one substantive entry each week.
2. Investigate and document your observations of how the subject material applies in a complex sociotechnical setting. This will require you to understand the subject matter content and then seek out and discuss a situation or workplace scenario, not necessarily where you are employed (e.g. volunteer organisation, the transport network in your town, the emergency department admissions system at your local hospital and so on), where that PtD issue can be seen.
3. Reflect upon and document your experiences of the term including:
 - your participation in group work on a safety case - the work you contributed to the effort of the group and any difficulties in documenting the safety case.
 - your own work on the small case #2 and #3.
 - your PtD position in this new technological age (such as space, connected vehicles, unmanned vehicles, drones, apps) as changemakers and facilitators.
 - your broader learnings in sociotechnical systems design and procedural design

You are encouraged to investigate and reference a range of external sources as you explore and reflect on the topics. Ensure that these are referenced in your journal using CQUni Harvard style.

Assessment Due Date

Part A due Monday Week 5; Part B due Friday Week 12

Return Date to Students

Return within 3 weeks of submission

Weighting

30%

Assessment Criteria

The depth and breadth of your response will be considered in the evaluation of your understanding of the PTD unit and the broader topic of PTD. You will be assessed on the depth of your reflection and its contribution to your learning as follows:

- the subject content and readings to understand the topic and make at least one substantive entry each week. (40%- 5% per week for 8 weeks)
- your observations of how the subject material applies in a complex sociotechnical setting. This will require you to understand the subject matter content each week and then seek out and discuss a situation or workplace scenario (not necessarily where you are employed e.g. volunteer organisation, the transport network in your town, the emergency department admissions system at your local hospital and so on) where that PtD issue can be seen. (40% - 5% per week for 8 weeks)
- your experiences of the term including (20%):
 - your participation in group work on a safety case - the work you contributed to the effort of the group and any difficulties in documenting the safety case.
 - your own work on the small case #2 and #3.
 - your PtD position in this new technological age (space, connected vehicles, unmanned vehicles, drones, apps) as changemakers and facilitators.
 - your broader learnings in sociotechnical systems design and procedural design

In assessing the work, value will be placed on the quality and clarity of the written word, on logic, on the accurate use of technical terms and on the quality of analytical thought and comment. Further details will be provided through the grading rubric on Moodle.

Referencing Style

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

Submission

Online

Submission Instructions

Written assignment submitted in one document. Submission must be readable by Turnitin.

Learning Outcomes Assessed

- Evaluate designs from a life cycle approach.
- Identify past and present opportunities and challenges to achieving 'prevention through design' including the design process, human factors engineering, adoption of new technology and impact of disruptive technologies.
- Evaluate potential risks associated with design issues in socio-technical systems around culture, processes, structures, equipment, tools and people by employing appropriate analytical methods.
- Assess the value of the elimination of hazards through the redesign of buildings and structures, work environments, materials, plant (machinery and equipment) job tasks and work environments.

Graduate Attributes

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

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