



# OCHS12019 Human Factors

## Term 2 - 2018

Profile information current as at 25/04/2024 06:47 pm

All details in this unit profile for OCHS12019 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 provides an understanding of human factors and how a knowledge of human strengths and limitations, both mental and physical, can lead to better safety outcomes in the real world. It will be concerned with end user design issues and human variability in work environments. Students will be exposed to foundational human factors principles and knowledge and learn human factors methods for the identification and assessment of human factors issues, as well as develop skills to make human factors design recommendations to enhance human performance in the real world.

### 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 2 - 2018

- Adelaide
- Brisbane
- Bundaberg
- Distance
- Gladstone
- Melbourne
- 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. Portfolio**

Weighting: 25%

### **2. Written Assessment**

Weighting: 25%

### **3. Group Work**

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**

The individual assistance by the lecturer assisted my overall performance in the unit.

##### **Recommendation**

Remain available to students to clarify queries.

#### Feedback from Have Your Say

##### **Feedback**

Information regarding the poster could be improved.

##### **Recommendation**

Information on developing the poster will be reviewed and updated for future offerings.

#### Feedback from Personal reflection

##### **Feedback**

Teamwork continues to challenge students

##### **Recommendation**

Reform assessments to enhance the development of teamworking skills.

## Unit Learning Outcomes

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

1. Use knowledge of the discipline of human factors including physical, cognitive and organisational ergonomics in a variety of contexts.
2. Apply human factors knowledge to the evaluation of work systems and equipment design including work capacity and limitation.
3. Discuss and demonstrate the use of human factors assessment tools to enable the development of problem identification skills on human factors issues within the workplace.
4. Develop team work and project management skills through the application of human factors assessment and solutions to design issues with the workplace.

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Portfolio - 25%	•		•	
2 - Written Assessment - 25%	•	•	•	
3 - Group Work - 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

## Textbooks and Resources

### Textbooks

OCHS12019

#### Prescribed

##### **An Introduction to Human Factors Engineering**

Edition: 2nd (2014)

Authors: Wickens, Lee, Liu, Gordon-Becker

Pearson Education Limited

Harlow , Essex , UK

ISBN: 10: 1-292-02231-0

Binding: Paperback

#### **Additional Textbook Information**

Paper copies are no longer being printed by the publisher, which means the CQUni Bookshop are no longer able to supply copies. Second hand copies may be available for purchase elsewhere.

Alternatively, an ebook version is available, follow this

link: <http://www.pearson.com.au/9781292035512>

## 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

**Elise Crawford** Unit Coordinator

[e.crawford@cqu.edu.au](mailto:e.crawford@cqu.edu.au)

## Schedule

### **Week 1 - 09 Jul 2018**

Module/Topic	Chapter	Events and Submissions/Topic
Introduction	Textbook Chapter: Introduction to Human Factors	Zoom tutorial: Hierarchical task analysis

### **Week 2 - 16 Jul 2018**

Module/Topic	Chapter	Events and Submissions/Topic
Physical ergonomics I	Textbook Chapter: Work physiology	Complete the <i>Belbin Team Role Test</i> located in Moodle. Zoom tutorial: Revised NIOSH Lifting Equation

### **Week 3 - 23 Jul 2018**

Module/Topic	Chapter	Events and Submissions/Topic
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Physical ergonomics II	Textbook Chapter: Biomechanics of work	Begin to form teams of four, for Assessment Item 3. Zoom tutorial: Rapid Entire Body Assessment
<b>Week 4 - 30 Jul 2018</b>		
Module/Topic	Chapter	<b>Events and Submissions/Topic</b>
Cognitive ergonomics I		
	Textbook Chapter: Cognition	Teams must be formed by close of business Friday, anyone without a team will be allocated by the Unit Coordinator. Zoom tutorial: Assessment 2 Posters and cognition
<b>Week 5 - 06 Aug 2018</b>		
Module/Topic	Chapter	<b>Events and Submissions/Topic</b>
Cognitive ergonomics II	Textbook Chapter: Displays	Start working on the team project (Assessment Item 3) Zoom tutorial: Developing a project plan (Assessment 3)
<b>Vacation Week - 13 Aug 2018</b>		
Module/Topic	Chapter	<b>Events and Submissions/Topic</b>
		<b>MSD Risk Poster</b> Due: Vacation Week Monday (13 Aug 2018) 9:00 am AEST
<b>Week 6 - 20 Aug 2018</b>		
Module/Topic	Chapter	<b>Events and Submissions/Topic</b>
Human factors in design	Textbook Chapter: Social factors	
<b>Week 7 - 27 Aug 2018</b>		
Module/Topic	Chapter	<b>Events and Submissions/Topic</b>
Organisational ergonomics I	Textbook Chapter: Selection and Training	<b>Team Project Plan Due:</b> Monday (27/08/18) 9:00 am AEST Zoom tutorial: Approaching the design project (Assessment 3)
<b>Week 8 - 03 Sep 2018</b>		
Module/Topic	Chapter	<b>Events and Submissions/Topic</b>
Organisational ergonomics II	Textbook Chapter: Stress and workload	Zoom tutorial: Defining the problem (Assessment 3)
<b>Week 9 - 10 Sep 2018</b>		
Module/Topic	Chapter	<b>Events and Submissions/Topic</b>
Work space design	Textbook Chapter: Engineering Anthropometry	Zoom tutorial: Anthropometric data for design  <b>Human Factors Research</b> Due: Week 9 Monday (10 Sept 2018) 9:00 am AEST
<b>Week 10 - 17 Sep 2018</b>		
Module/Topic	Chapter	<b>Events and Submissions/Topic</b>
Environmental design	Prescribed reading • Environmental ergonomics (Parsons 2000)	Zoom tutorial: Systematic analysis of solutions (Assessment 3)
<b>Week 11 - 24 Sep 2018</b>		
Module/Topic	Chapter	<b>Events and Submissions/Topic</b>
The practice of human factors	Textbook Chapter: Research Methods	Zoom tutorial: The redesign concept proposal (Assessment 3)

Week 12 - 01 Oct 2018		
Module/Topic	Chapter	Events and Submissions/Topic
Human factors in project work		
Review/Exam Week - 08 Oct 2018		
Module/Topic	Chapter	Events and Submissions/Topic
		Design Project 1. Individual Reflections 2. Individual Self & Peer Review 3. Team Redesign Proposal
		<b>Design Project</b> Due: Review/Exam Week Monday (8 Oct 2018) 9:00 am AEST
Exam Week - 15 Oct 2018		
Module/Topic	Chapter	Events and Submissions/Topic

## Term Specific Information

The CQUniversity bookshop will not be stocking the hard copy of this textbook. You will need to source a copy from somewhere else. There is an ebook version available from the following link:  
<http://www.pearson.com.au/9781292035512>

## Assessment Tasks

### 1 Human Factors Research

#### Assessment Type

Portfolio

#### Task Description

As with all professions, evidence-based practice is extremely important to the integrity of the profession. Therefore, knowing where to find evidence to support practice is valuable for improving human factors concerns that impact health and safety. This exercise is intended to help you practice your research skills and to give all students a brief overview of some of the research being conducted in the field of Human Factors (aka Ergonomics). Furthermore, this exercise may also serve as a useful starting point for the other assessments. Your task is to do the following:

- Post a review of one (1) research article from a peer reviewed journal that no other student has reviewed (word limit 150) (16 marks)
- Reply to at least three (3) of your colleagues to extend the discussion topic (word limit 100 each) (3 marks each)
- Ensure you make one contribution in each of the four domain forums
- In total, you will have made four (4) contributions, one in each domain forum
- References (not included in the word count)

The four domain forums for this assessment item are:

- Physical Ergonomics
- Cognitive Ergonomics
- Organisational Ergonomics
- Environmental Ergonomics

**Item 1.** To post your research article review, start a new topic and provide the citation of the article in the topic header, e.g. (Smith 2018). This will make it easier to know which articles have been reviewed. Your post should include:

- The research article review (aim/problem, methods, results, conclusions)
- A complete reference and publication DOI number
- The attached article (pdf)

**Item 2.** The reply posts should meaningfully extend the topic. To do this you may:

- Relate a personal experience, or

- Relate another study, news story, or other source (cite and include references where appropriate).

*NOTE: all reviewed articles must be published in a journal. Therefore, do not review chapters, books, white papers, conference papers, workbooks, handbooks, and the like for the review post (Item 1 above). However, these items are acceptable in a reply post where appropriate (Item 2 above).*

### **Assessment Due Date**

Week 9 Monday (10 Sept 2018) 9:00 am AEST

### **Return Date to Students**

Week 11 Monday (24 Sept 2018)

### **Weighting**

25%

### **Assessment Criteria**

#### **The review post (16 marks):**

1. Journal article is published and attached (1 mark)
2. The aim of the study/article (2 marks)
3. The human interaction problem being investigated/discussed (1 marks)
4. The research method used (4 marks)
5. The research findings and conclusions drawn (5 marks)
6. Reference and DOI number, word limit (3 marks)

#### **The meaningful reply (3 marks each):**

1. Adds meaningfully to the discussion (2 marks)
2. References included where appropriate (1 mark)

### **Referencing Style**

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

### **Submission**

Online

### **Learning Outcomes Assessed**

- Use knowledge of the discipline of human factors including physical, cognitive and organisational ergonomics in a variety of contexts.
- Discuss and demonstrate the use of human factors assessment tools to enable the development of problem identification skills on human factors issues within the workplace.

### **Graduate Attributes**

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

## **2 MSD Risk Poster**

### **Assessment Type**

Written Assessment

### **Task Description**

An important skill of safety science professionals is to identify work tasks that present Musculoskeletal Disorder (MSD) risks. This assignment is about developing your understanding of the principles of assessment for physical human-task interactions while at work. You are required to identify a manual handling task that involves a two-handed lift. You are required to conduct a *hierarchical task analysis* and then to assess the task being carried out using two different human factors analytical tools. You must use the *Revised NIOSH Lifting Equation* and another suitable tool (e.g. *RULA*, *REBA*). From the findings of your analyses you are to offer redesign recommendations. Your work is to be presented in a scientific poster abstract format. The poster should incorporate design principles to achieve low cognitive load for the viewer. The poster is to be suitable for display at a conference to inform delegates of the physical task you have assessed.

Your poster should contain the following:

1. Describes the context of the workplace or other setting

2. Identifies who is at risk (stakeholders)
3. Describes the task being performed
4. Identifies the MSD risk and when it arises during the task
5. Discusses the significance of the risk
6. Redesigns the task to reduce the MSD risks found
7. Reference list contains scholarly articles that are appropriately referenced

**Assessment Due Date**

Vacation Week Monday (13 Aug 2018) 9:00 am AEST

**Return Date to Students**

Week 7 Monday (27 Aug 2018)

**Weighting**

25%

**Assessment Criteria****Poster content:**

1. Identifies context of workplace and/or other setting and people involved (2 marks)
2. Describes the task being assessed (2 marks)
3. Conducts a hierarchical task analysis (2 marks)
4. Assesses the MSD risk using two appropriate human factors analytical tools (6 marks)
5. Discusses the significance of the risk (2 marks)
6. Redesigns the task to reduce the MSD risks found (4 marks)
7. Reference list contains scholarly articles that are appropriately referenced (2 marks)

**Poster design:**

Utilises human factors design principles to enhance swift comprehension of the message portrayed (e.g. low cognitive load, colour, placement, imagery, etc.) (5 marks)

**Referencing Style**

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

**Submission**

Online

**Learning Outcomes Assessed**

- Use knowledge of the discipline of human factors including physical, cognitive and organisational ergonomics in a variety of contexts.
- Apply human factors knowledge to the evaluation of work systems and equipment design including work capacity and limitation.
- Discuss and demonstrate the use of human factors assessment tools to enable the development of problem identification skills on human factors issues within the workplace.

**Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy

## 3 Design Project

**Assessment Type**

Group Work

**Task Description**

This project has three main objectives:

1. to develop leadership and project management skills relevant to design projects
2. to develop design thinking and the user-centred design process
3. to develop reflective practice

You are required to complete the following tasks:

1. Team project plan (10 marks)
2. Team concept proposal (30 marks)

3. Individual reflections (management of the team) (5 marks)
4. Self and peer review (member contribution) (5 marks)

Unless there are exceptional circumstances, all team members will receive the same grade for team submissions. It is up to the individual team members to negotiate how the final proposal will be written. Teams may choose to allocate different sections to each team member, or the team may allocate one member to write the report and each team member provides the relevant content to that member. It is strongly recommended that one team member be the coordinator of the final document.

## **1. Team Project Plan**

As a team, you are to develop a team project plan to establish lines of communication and rules of process. Before developing the project plan, you are required to complete an individual *team role test* that is provided on our Moodle site. The results from this test will be used to form your team and help you build your team profile. Details about forming teams will be provided on the Moodle site. In 1000 to 1200 words, the project plan should contain:

- Team profile (team leader, roles, strengths & limitations)
- Communication details and arrangements
- Tentative schedule of milestones, dates and responsibilities
- Issues resolution plan (that all members agree to)

## **2. Team Concept Proposal**

As a team, you are to prepare and submit online one Concept Proposal. Your task is to find a usability problem with a product (i.e. problematic human-machine interaction) and to apply human factors design principles and tools to assess the interaction problem. Based on analyses, your team is to propose redesign changes to the product to improve usability in the form of a Redesign Concept Proposal. In 3000 words, the proposal should include:

- Title page
- Executive summary
- Table of contents
- Significance of the usability problem
- Methods
- Results and Discussion
- Problem definition statement (and associated success criteria)
- Redesign options
- Justification and details of chosen concept (including: technical drawings and materials costing)
- References
- Appendices (if necessary)

The word limit excludes: title page, executive summary, table of contents, reference list, and appendices.

Proposal presentation layout:

- Single document
- Professional proposal format and headings
- 1.5 line spacing
- Word document
- Sketches and/or photos can be included but total file size cannot exceed 10MB.

## **3. Team management**

- Individual Reflections

As individuals, you are required to reflect on your teamwork experience by answering two questions. Your reflections are to be completed on the *Individual Reflections Form* available on Moodle. Please submit online by the due date to avoid a late penalty. The total word range for reflections is 200 to 400 words. Your work will be marked on the quality of the writing and the depth of academic reflection about the learning experience during the development of the concept proposal project. Journal entries that reflect on the lessons learned during project completion will receive a higher grade than entries that simply list tasks performed.

The two questions to be answered relate to the management of the team:

1. What I did to help create a productive team effort?
  2. What I will do differently in the future to make teamwork more productive?
- Self & Peer Review

In Week 11 you will be provided a link to an online survey via email. You will grade yourself using the set criteria, and then grade each of your fellow team members using the same criteria. To be fairly graded by fellow team members, you will need to let team members know exactly what has been done during the development of the project plan and concept proposal. If student work performance is poor, or communication skills are poor, the peer review mark will

reflect this. This survey must be completed prior to the due date when it will close.

The Unit Coordinator will allocate a grade based on a combination of the self-assessment and the peer review mark allocated by fellow team members. If you believe that the peer assessment is unfair, you can make a case to the Unit Coordinator who will moderate the grade on a case-by-case basis.

### **Assessment Due Date**

Review/Exam Week Monday (8 Oct 2018) 9:00 am AEST

### **Return Date to Students**

Exam Week Friday (19 Oct 2018)

### **Weighting**

50%

### **Assessment Criteria**

#### **Team Project Plan (10 marks)**

1. Team profile (2 marks)
2. Communication details and arrangements (2 marks)
3. Tentative schedule of project stage completion, dates and responsibilities (3 marks)
4. Issues resolution plan (3 marks)

#### **Team Concept Proposal (30 marks)**

1. Integrates principles of human capability and limitations (physical and cognitive) (5 marks)
2. Analyses the usability problem including the environment of use (5 marks)
3. Develops a suitable problem definition statement and success criteria (5 marks)
4. Systematically evaluates potential concept solutions (5 marks)
5. Develops a redesign concept that meets the problem definition from a human and technical perspective (5 marks)
6. Format is consistent with a professional concept proposal in that it contains all relevant parts, is logically argued, structured appropriately, clearly expressed, and void of grammatical and referencing errors (5 marks)

### **Team management (10 marks)**

#### 1. Individual Reflections (5 marks)

- Assessed on depth of academic reflection about the learning experience of the project (5 marks)

NOTE: Journal entries that reflect on the lessons learned during project work will receive a higher grade than entries that simply list tasks performed

#### 2. Self & Peer Review (5 marks)

- Average score from the self and peer review process (5 marks)

### **Referencing Style**

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

### **Submission**

Online Group

### **Submission Instructions**

Note there are three items to submit: (1) the team concept proposal, (2) the individual reflections, and (3) the self & peer assessment. The team concept proposal is to be submitted by one team member only.

### **Learning Outcomes Assessed**

- Apply human factors knowledge to the evaluation of work systems and equipment design including work capacity and limitation.
- Develop team work and project management skills through the application of human factors assessment and solutions to design issues with the workplace.

### **Graduate Attributes**

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

- Cross Cultural 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