



# EDCU12040 *Biological and Earth and Space Sciences*

## Term 1 - 2019

Profile information current as at 16/05/2024 11:01 am

All details in this unit profile for EDCU12040 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

Biological and Earth and Space Sciences develops understanding of both the content and pedagogy required to teach Science in Primary and Early Childhood classrooms. Students are introduced to concepts around how children learn Science; the importance of Science education in an Australian and international context; and current views around effective pedagogical practice linked to research. The focus on pedagogy will be linked to two content areas from the Australian Curriculum: Biological sciences and Earth and Space sciences.

### Details

Career Level: *Undergraduate*

Unit Level: *Level 2*

Credit Points: 6

Student Contribution Band: 7

Fraction of Full-Time Student Load: 0.125

### Pre-requisites or Co-requisites

There are no requisites for this unit.

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

- Bundaberg
- Cairns
- Gladstone
- Mackay
- Noosa
- Online
- 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**

Weighting: 50%

#### 2. **Practical and Written Assessment**

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 Student Feedback Survey

##### **Feedback**

Assessment and unit content constructively aligned

##### **Recommendation**

Retain context cuing devices, support videos and embedded instructions in the MOODLE. Continue to devise and record assessment specific lectures to assist with student progress.

#### Feedback from Student Feedback Survey

##### **Feedback**

Assessment and course content relevant and future oriented.

##### **Recommendation**

Retain applied assessment linked to professional standards as an organising principle.

#### Feedback from Student feedback survey

##### **Feedback**

Textbook cost and use should be reviewed as cost is considerable.

##### **Recommendation**

Retain dual textbook resources. Both texts are used in EDCU13017 and EDCU12040 so cost represents an investment for two term units and is reasonable.

## Unit Learning Outcomes

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

1. Evaluate examples of teaching practice in science to identify how connections are made to students' prior knowledge or experience to promote learning and inform pedagogical practice
2. Access/evaluate and apply professional literature on contemporary science education to develop a rationale for learning design
3. Analyse and incorporate content that recognises the experience of Aboriginal and Torres Strait Islander students in the science classroom
4. Select teaching and learning strategies that promote higher order thinking and scaffold students' understanding of core concepts in the areas of Biological and Earth and Space sciences
5. Create learning resources in which learner engagement is transformed by the use of ICT for collaboration and inquiry.

### **Successful completion of this unit provides opportunities for students to engage with the Australian Professional Standards for Teachers (Graduate Career Stage) focus areas of:**

- 1.1 Physical, social and intellectual development and characteristics of students
- 1.2 Understand how students learn
- 1.4 Strategies for teaching Aboriginal and Torres Strait Islander students
- 2.1 Content and teaching strategies of the teaching area
- 2.2 Content selection and organisation
- 2.6 Information and Communication Technology (ICT)
- 3.3 Use teaching strategies
- 3.4 Select and use resources
- 4.1 Support student participation

## Alignment of Learning Outcomes, Assessment and Graduate Attributes

 N/A Level	 Introductory Level	 Intermediate Level	 Graduate Level	 Professional Level	 Advanced Level
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### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
1 - Presentation - 50%	•	•	•		
2 - Practical and Written Assessment - 50%		•		•	•

### 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 - Presentation - 50%	•	•	•	•		•	•			
2 - Practical and Written Assessment - 50%	•	•	•	•		•	•			

## Textbooks and Resources

### Textbooks

EDCU12040

#### Prescribed

##### **Connecting with science education**

Edition: 2nd edn (2018)

Authors: Gregson, Robyn (ed)

Oxford University Press

Melbourne , VIC , Australia

ISBN: 9780190309343

Binding: Paperback

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#### Prescribed

##### **Teaching primary science: promoting enjoyment and developing understanding**

Edition: 3rd edn (2017)

Authors: Loxley et. al.

Routledge

London , UK

ISBN: 9781138651838

Binding: Paperback

#### **Additional Textbook Information**

Both books can be purchased at the CQUni Bookshop here: <http://bookshop.cqu.edu.au> (search on the Unit code)

[View textbooks at the CQUniversity Bookshop](#)

### IT Resources

**You will need access to the following IT resources:**

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

## Referencing Style

All submissions for this unit must use the referencing style: [American Psychological Association 6th Edition \(APA 6th edition\)](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**Brendan Jacobs** Unit Coordinator

[b.jacobs@cqu.edu.au](mailto:b.jacobs@cqu.edu.au)

## Schedule

### Week 1 - 11 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Theoretical Frameworks in Teaching Science - This topic introduces you to the **Australian Curriculum** which forms the backbone of the lessons you will teach in the classroom. The different pedagogies that can be employed and utilised in the science classroom are described and explored.

Gregson et al. (2012/2017) Chapters 1 and 2

Discussion Board contribution for week one

## Week 2 - 18 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Curriculum Design - The Anatomy of a Science Unit- This topic examines the importance of science in our world and the power of science even though scientific ideas change over time. Science should be taught in ways that recognise the limits of present understanding.	Gregson et al. (2012/2017) Chapter 2	

## Week 3 - 25 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Learning and Teaching Scientifically - The Australian Curriculum: Science states that the three strands <b>Science Understanding, Science Inquiry Skills and Science as a Human Endeavour</b> are of equal importance. To understand what this means one needs to understand the nature of each strand and how these enable us to think scientifically.	Gregson et al. (2012/2017) Chapter 3	

## Week 4 - 01 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Curriculum Priorities - Aboriginality, Engagement in Asia & Sustainability: This topic examines the Australian Curriculum which is designed to meet the needs of students by delivering a relevant, contemporary and engaging curriculum that builds on the educational goals of the Melbourne Declaration.	Gregson et al. (2012/2017) Chapters 3 and 4.	

## Week 5 - 08 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Engaging Learners: Engagement is not simply being focused in class. Engagement is affected by emotional, behavioural and external factors. This topic outlines models of teaching that increase student engagement. The 5Es teaching model is about preparing lessons that are engaging for students and enhance their learning.	Gregson et al. (2012/2017) Chapters 5 and 6.	Discussion Board contribution

## Vacation Week - 15 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Non-teaching week.		

## Week 6 - 22 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Working Scientifically: The future of science in schools is shaped by changing scientific practices, changing demands and expectations of students, and by bringing science learning into the real world of science in society.

Gregson et al. (2012/2017) Chapter 7. Students are also referred to the SCOOTLE Resource - How to Teach Science.

**Pecha Kucha** Due: Week 6 Thursday (25 Apr 2019) 11:45 pm AEST

### Week 7 - 29 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
STEM, STEAM & Digital Approaches to Learning: ICT, the internet, mobile and social computing are essential ingredients for infusing science education with authentic science in the world. The challenge for teachers is to capitalise on emerging technologies for purposeful learning.	Gregson et al. (2012/2017) Chapter 7.	

### Week 8 - 06 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Biological Sciences - Overview: This week and next week focus on the content of the Biological Sciences strand of the Australian Curriculum.	Loxley et al. (2017) Chapters 12 and 13	

### Week 9 - 13 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Biological Sciences - Investigations: <ul style="list-style-type: none"> <li>• Adaptations</li> <li>• Evolution</li> <li>• Plant Biology</li> </ul>	Loxley et al. (2017) Chapters 14 and 15.	Discussion Board Contribution

### Week 10 - 20 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Earth & Space Sciences: Overview- This week's focus on the content of the Earth and Space Sciences strand of the Australian Curriculum	Loxley et al. (2017) Chapter 11.	

### Week 11 - 27 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Earth and Space Science: Investigations - This week we explore how to engage learners in classroom investigations around the theme of Earth and Space Sciences.	Gregson et al. (2012/2017) pp. 290 -94 Loxley et al. (2017) Specified excerpts from Chapters 13, 14 & 15.	Discussion Board Contribution

### Week 12 - 03 Jun 2019

Module/Topic	Chapter	Events and Submissions/Topic
Review and Consolidation: Course Plenary	No set readings	<b>Digital Task Cards</b> Due: Week 12 Thursday (6 June 2019) 11:45 pm AEST

### Review/Exam Week - 10 Jun 2019

Module/Topic	Chapter	Events and Submissions/Topic
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### Exam Week - 17 Jun 2019

Module/Topic	Chapter	Events and Submissions/Topic
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## Assessment Tasks

### 1 Pecha Kucha

#### Assessment Type

Presentation

#### Task Description

Prepare and deliver a "Pecha Kucha 20 x 20" presentation on one of the 10 research topics provided in the assessment link. Topics focus on contemporary issues in Science education and research, including how children learn Science, the structure of the curriculum, and pedagogy for teaching Science.

You need to demonstrate your understanding of key concepts in the strands of either Biology or Earth and Space Science AND incorporate relevant research on the three Australian Curriculum cross curriculum priorities, and how these complement the development of Western scientific knowledge.

#### Assessment Criteria

- Knowledge and understanding of the content, concept development and teaching strategies of the Science curriculum.
- Demonstrated understanding of Australian Curriculum cross curriculum priorities - Aboriginal and Torres Strait Islander perspectives, Asia perspectives, and Sustainability perspectives.
- Use of authoritative sources to justify and explain approaches to science teaching that promote learning and enjoyment.
- Identification and explanation of issues in contemporary science education and pedagogy.

#### Assessment Due Date

Week 6 Thursday (25 Apr 2019) 11:45 pm AEST

Pecha Kucha Upload

#### Return Date to Students

Week 8 Thursday (9 May 2019)

Feedback on this assessment task will be returned following moderation and in sufficient time to inform students in preparation for Assessment Task 2.

#### Weighting

50%

#### Assessment Criteria

Criterion 1: Explanation of a chosen issue in Science Education and pedagogy from the listed Topic Sheet

Criterion 2: Explanation of a chosen issue in Science Education and pedagogy from the listed Topic Sheet

Criterion 3: Knowledge and understanding (K&U) of the content, concept development and teaching strategies of the science curriculum

Criterion 4: Demonstrated understanding of the curriculum priorities of the AC - Aboriginal & Torres Strait Islander, Asia and Sustainability perspectives

Criterion 5: Clear and concise "Pecha Kucha 20 x 20" presentation using authoritative sources to justify and explain approaches to science teaching that promote learning and enjoyment

#### Referencing Style

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)

#### Submission

Online

#### Submission Instructions

Upload via EDCU12040 MOODLE site

#### Learning Outcomes Assessed

- Evaluate examples of teaching practice in science to identify how connections are made to students' prior knowledge or experience to promote learning and inform pedagogical practice
- Access/evaluate and apply professional literature on contemporary science education to develop a rationale for learning design
- Analyse and incorporate content that recognises the experience of Aboriginal and Torres Strait Islander students in the science classroom

#### Graduate Attributes



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

## 2 Digital Task Cards

### Assessment Type

Practical and Written Assessment

### Task Description

Part A: Use professional literature to write a brief comparison of two alternate pedagogies for science teaching.

Part B: Develop TWO digital task cards that could be used to scaffold independent learning in Science. The cards should demonstrate a clear understanding of the pedagogies selected in Part A (one card for each pedagogy) and use content from the two strands of Biological (for one card) and Earth and Space Sciences (for the other card). The cards should cover a range of activities and include:

- a card suitable for use by learners in a Primary classroom (select one year level from Prep to Year 6). This card must be printable and suitable for the age group to use with some teacher support.
- A second card for use with early childhood students (0 - 5) OR a year level from Year 7 to Year 9 (depending on your enrolment within the Early Childhood program or the Primary program) which scaffolds the use of an online simulation. This card must include teacher instructions for use in the classroom.
- Each card should contain hyperlinks that identify the scientific understanding and skills from the curriculum that it supports and teaching ideas for use of the card in the classroom.

### Assessment Due Date

Week 12 Thursday (6 June 2019) 11:45 pm AEST

### Return Date to Students

Exam Week Thursday (20 June 2019)

Feedback on this assessment task will be returned following moderation and in sufficient time to inform students of result.

### Weighting

50%

### Assessment Criteria

- Knowledge and understanding of the use of ICTs in supporting student centred learning and engagement.
- Demonstrated knowledge of the content and structure of the chosen strands of the Science curriculum.
- Relevance of the resources and chosen strategies for the target group and learners' developmental stages.
- Selection of teaching strategies that show understanding of approaches that support the processes of working scientifically.

### Referencing Style

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)

### Submission

Online

### Submission Instructions

Submit via the EDCU12040 MOODLE site

### Learning Outcomes Assessed

- Access/evaluate and apply professional literature on contemporary science education to develop a rationale for learning design
- Select teaching and learning strategies that promote higher order thinking and scaffold students' understanding of core concepts in the areas of Biological and Earth and Space sciences
- Create learning resources in which learner engagement is transformed by the use of ICT for collaboration and inquiry.

### Graduate Attributes

- Communication
- Problem Solving

- Critical Thinking
- Information Literacy
- Information Technology Competence
- Cross Cultural Competence

## 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