



EDCU13020 Mathematics Curriculum

Term 2 - 2021

Profile information current as at 18/04/2024 04:28 pm

All details in this unit profile for EDCU13020 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

In Mathematics Curriculum, students build on the knowledge acquired in previous Mathematics units to develop deep understanding of the structure, sequencing and links between critical concepts and skills in content across the year levels in the Australian Curriculum: Mathematics. They apply this knowledge to identify issues or challenges to mathematical understanding and problem-solving in key stages of the learning sequence as a guide for developing diagnostic assessment tools. Students develop resources to prevent or overcome difficulties in the development of Mathematical knowledge and skills and design and justify approaches to using physical and digital resources to teach specific sub-strands of the curriculum to overcome barriers to learning and improve the transfer of mathematical reasoning, logic and analysis to problem-solving situations. Personal numeracy competence is enhanced in this unit as students develop suggested marking guides for diagnostic assessment using appropriate and accurate mathematical procedures and communication.

Details

Career Level: *Undergraduate*

Unit Level: *Level 3*

Credit Points: 6

Student Contribution Band: 7

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Prerequisite:- Students must successfully complete the unit EDCU12038 prior to enrolling in 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 2 - 2021

- Bundaberg
- Cairns
- Mackay City
- 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. **Practical and Written Assessment**

Weighting: 50%

2. **Presentation 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

Feedback

Moodle organisation and navigation supported learning, and the visuals, resources and teaching scaffolded knowledge and skills required for the assessment tasks.

Recommendation

Retain unit learning materials to scaffold understanding.

Feedback from Student feedback

Feedback

The assessment tasks are authentic and provide significant learning opportunities. Assessment Task 1 is sizeable.

Recommendation

Review alignment and balance of Assessment Task 1 and Assessment Task 2.

Unit Learning Outcomes

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

1. Analyse the structure and organisation of content in the Mathematics curriculum to identify key stages in concept development as a focus for learning and diagnostic assessment
2. Appraise Mathematics content to identify possible misconceptions or barriers to learning for diverse student groups
3. Distinguish evidence-based approaches to teaching Mathematics that promote engagement, understanding and mathematical proficiency for students from diverse backgrounds including Aboriginal and Torres Strait Islander students
4. Design diagnostic tools and reliable guides for assessing students' knowledge and skills in Mathematics
5. Reflect on professional learning to describe processes and strategies that improve teaching practice and student learning
6. Justify the selection and use of resources that scaffold students' understanding of core mathematical concepts
7. Identify opportunities for students to use ICTs purposefully to gain mathematical knowledge and proficiency.

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
- 1.3 Students with diverse linguistic, cultural, religious and socioeconomic backgrounds
- 1.4 Strategies for teaching Aboriginal and Torres Strait Islander students
- 2.1 Content and teaching strategies of the teaching area
- 2.5 Literacy and numeracy strategies
- 2.6 Information and Communication Technology (ICT)
- 3.4 Select and use resources
- 5.1 Assess student learning
- 6.2 Engage in professional learning and improve practice
- 6.4 Apply professional learning and improve student learning

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

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
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 - Practical and Written Assessment - 50%	•	•	•	•	•		•			
2 - Presentation and Written Assessment - 50%	•	•	•	•		•		•		

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: [American Psychological Association 7th Edition \(APA 7th edition\)](#)

For further information, see the Assessment Tasks.

Teaching Contacts

Mark Gronow Unit Coordinator
m.gronow@cqu.edu.au

Schedule

Week 1 - 12 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
Australian Curriculum: Mathematics P-6, Part 1	View: Australian Curriculum: Mathematics Australian Curriculum: Review Australian Curriculum: Review/Mathematics	

Week 2 - 19 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
Australian Curriculum: Mathematics P-6, Part 2	Website: National Numeracy Learning Progression Video: Mathematical Proficiency Strands	

Week 3 - 26 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
Diversity in Mathematics	Reading: Boaler, J. et al. (2016) Seeing as Understanding: The importance of Visual Mathematics for our Brain and Learning Jorgensen, R. (2015) Language, Culture and Access to Mathematics: a Case of one Remote Aboriginal Community All readings can be found in the Unit eReading list.	

Week 4 - 02 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
Diagnostic Assessment in P - 6 Mathematics, Part 1	Readings: O'Neill, L (2011) What students need to know and understand about Number O'Neill, L (2011) What students need to know and understand about Algebra O'Neill, L (2011)What students need to know and understand about Measurement O'Neill, L (2011 What students need to know and understand about Spatial Concepts and Geometry O'Neill, L (2011) What students need to know and understand about Statistics and Probability All readings can be found in the Unit eReading list.	

Week 5 - 09 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
Diagnostic Assessment in P - 6 Mathematics, Part 2	Readings Ryan, J. & Williams, J., (2007) Children's Mathematics 4 - 15 All readings can be found in the Unit eReading list.	

Vacation Week - 16 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 23 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
Professional Learning for Teachers of Mathematics	Readings: Borko, J. et al (2010) Contemporary Approaches to Teacher Professional Development Readings Chapman, O. (2013) A self-directed professional development approach to transforming teachers' practice to support mathematical thinking State Government of Victoria (2021) Effective Professional Learning All readings can be found in the Unit eReading list.	Creating a Diagnostic Assessment Activity Due: Week 6 Thursday (26 Aug 2021) 11:45 pm AEST

Week 7 - 30 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
Mathematical Pedagogy	Readings Taylor, J. & Harris, A. (2012) Learning and Teaching Mathematics 0-8 Chapter 1 Clements, D., et al. (1990) Constructivist learning and teaching Protheroe, N. (2007) What does good math instruction look like? All readings can be found in the Unit eReading list.	

Week 8 - 06 Sep 2021

Module/Topic	Chapter	Events and Submissions/Topic

Developing Mathematical Understanding, Part 1

Readings:
[Gough, J., \(1999\) Playing mathematical games: When is a game not a game?](#)
[Buchheister, K., et al. \(2017\) Maths games: A universal design approach to mathematical reasoning](#)
[Bragg, L. \(2003\) Children's perspectives on mathematics and game playing.](#)

All readings can be found in the Unit eReading list.

Week 9 - 13 Sep 2021

Module/Topic	Chapter	Events and Submissions/Topic
Developing Mathematical Understanding, Part 2	Readings Attard, C. & Northcote, M. (2011) Mathematics on the move: Using mobile technologies to support student learning. Small, M. (2017) Good Questions: Great ways to differentiate instruction the standards-based classroom. All readings can be found in the Unit eReading list.	

Week 10 - 20 Sep 2021

Module/Topic	Chapter	Events and Submissions/Topic
Learning Engagement in Mathematics	Reading Attard, C. (2012) Engagement with mathematics: What does it mean and what does it look like? Boaler, J. et al. (2015) Mathematical Mindsets All readings can be found in the Unit eReading list.	

Week 11 - 27 Sep 2021

Module/Topic	Chapter	Events and Submissions/Topic
Numeracy in Mathematics	Readings Goos, M., et al. (2012) Numeracy across the curriculum Breed, M (2012) Using the scaffolding numeracy in the middle years materials to support students learning. All readings can be found in the Unit eReading list.	

Week 12 - 04 Oct 2021

Module/Topic	Chapter	Events and Submissions/Topic
Revision and Conclusion		Engaging Students in Learning Mathematics Due: Week 12 Thursday (7 Oct 2021) 11:45 pm AEST

Review/Exam Week - 11 Oct 2021

Module/Topic	Chapter	Events and Submissions/Topic
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Exam Week - 18 Oct 2021

Module/Topic	Chapter	Events and Submissions/Topic
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- 25 Oct 2021

Module/Topic	Chapter	Events and Submissions/Topic
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Assessment Tasks

1 Creating a Diagnostic Assessment Activity

Assessment Type

Practical and Written Assessment

Task Description

This task requires you to examine the relationship between curriculum, pedagogy and assessment and apply your knowledge and understanding to develop and enhance your teaching and assessment practices in mathematics. The task will involve an examination of the progression and development of the content knowledge from a chosen content description from the Number and Algebra strand of the Australian Curriculum: Mathematics. You will:

- Describe the issues for teaching, learning and assessing student understanding of the mathematical content from the content description.
- Propose and discuss pedagogical responses to the barriers you describe, and consider how the proficiency strands may be reflected in the teaching and learning responses.
- Engage in personal research to identify specific teaching responses that enable learners from diverse backgrounds to engage with the mathematical thinking, with justification from professional literature.
- Create a diagnostic **assessment** activity that is embedded in a mathematics lesson.
- Develop an assessment marking guide.
- Reflect on how this assessment task provides a context for your professional learning.

Assessment Due Date

Week 6 Thursday (26 Aug 2021) 11:45 pm AEST
individual written submission

Return Date to Students

Week 9 Friday (17 Sept 2021)

Weighting

50%

Assessment Criteria

Knowledge and understanding of the concepts, substance and structure of the content in the Mathematics curriculum (APST 2.1)

Ability to create and modify appropriate assessment tools that determine students' prior knowledge and achievement and understanding of mathematical concepts (APST 5.1)

Knowledge and understanding of barriers to mathematical proficiency and appropriate pedagogical responses to differentiate for diverse learning needs (APST 1.1, 1.2, 1.3, 1.4, 2.5)

Demonstrated understanding of the relationship between professional learning for teachers and improved student outcomes (APST 6.2, 6.4)

Application of academic writing conventions and adherence to APA style and referencing

Referencing Style

- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

Submission

No submission method provided.

Submission Instructions

Submit as one word document with the file name SURNAME_First name_StudentNumber_EDCU13020_AT1 eg SMITH_Max_1234567_EDCU13020_AT1

Learning Outcomes Assessed

- Analyse the structure and organisation of content in the Mathematics curriculum to identify key stages in concept development as a focus for learning and diagnostic assessment
- Appraise Mathematics content to identify possible misconceptions or barriers to learning for diverse student groups
- Distinguish evidence-based approaches to teaching Mathematics that promote engagement, understanding and mathematical proficiency for students from diverse backgrounds including Aboriginal and Torres Strait Islander students
- Design diagnostic tools and reliable guides for assessing students' knowledge and skills in Mathematics

- Reflect on professional learning to describe processes and strategies that improve teaching practice and student learning

Graduate Attributes

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

2 Engaging Students in Learning Mathematics

Assessment Type

Presentation and Written Assessment

Task Description

This task requires you to investigate resources and strategies that engages students of diverse backgrounds in the learning mathematics. You will address the barriers and misconceptions relating to the mathematical concept connected to your resource and strategy activity. The results of your investigation will be showcased through a professional learning experience to enhance your knowledge of the Australian Curriculum: Mathematics, and demonstrate your understanding and disposition of teaching and learning mathematics.

In this task you will:

- Identify and explain a specific barrier and/or misconception, that impacts on the development of understanding a mathematical concept specifically related to a content description from the year 3 or 4 level in the Measurement and Geometry strand of the Australian Curriculum: Mathematics.
- Give current research evidence for the barrier and/or misconception.
- Select or create two resources, that will engage learners in developing understanding of the mathematical concept and address the barrier and/or misconception. One of the two resources selected must be ICT focused.
- Create a digital presentation that showcases the two resources.
- Complete a written justification that draws on professional literature.

Assessment Due Date

Week 12 Thursday (7 Oct 2021) 11:45 pm AEST

Written submission and presentation

Return Date to Students

Submit as a word document with the file name SURNAME_First name_StudentNumber_EDCU13020_AT1_Part 1 and a presentation (powerpoint, prezi or online web) with file name SURNAME_First name_StudentNumber_EDCU13020_AT1_Part 2

Weighting

50%

Assessment Criteria

Knowledge and understanding of resources that address mathematical misconceptions or barriers to understanding for learners from diverse backgrounds and experiences (APST 1.1, 1.3)

Knowledge and selection of appropriate resources that engage students in learning mathematics and expand learning opportunities (APST 3.4)

Knowledge and selection of purposeful ICTs that support mathematical knowledge and proficiency (APST 2.6)

Application of academic writing conventions and adherence to APA style and referencing

Referencing Style

- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

Submission

No submission method provided.

Learning Outcomes Assessed

- Appraise Mathematics content to identify possible misconceptions or barriers to learning for diverse student groups

- Justify the selection and use of resources that scaffold students' understanding of core mathematical concepts
- Identify opportunities for students to use ICTs purposefully to gain mathematical knowledge and proficiency.

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