EDCU13020 *Mathematics Curriculum*
Term 2 - 2024

Profile information current as at 06/07/2025 10:00 am

General Information

Overview

In Mathematics Curriculum, you will build on the knowledge acquired in previous mathematics units to develop a deeper understanding of the structure, sequencing and connections between the critical concepts and skills in mathematical content across the year levels in the Australian Curriculum: Mathematics. You will learn to solve problems through transference of mathematical knowledge using acquired reasoning, logic, and analytical skills. You will be able to identify physical and digital resources and justify differing pedagogies used to teach the sub-strands of the Australian Curriculum: Mathematics to overcome barriers to learning mathematics for children of diverse backgrounds. Your personal competence and proficiency towards mathematics teaching is enhanced in this unit, you will learn to identify issues and challenges to mathematical understanding at key stages of the Australian Curriculum: Mathematics. The learning sequence of this unit supports your ability to develop, and use, a suitable range of appropriate and accurate assessment processes to evaluate the mathematics learnt.

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 - 2024

- Bundaberg
- Mackay
- 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. **Written Assessment**
Weighting: 45%
2. **Reflective Practice Assignment**
Weighting: 45%
3. **Peer assessment**
Weighting: 10%

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
Assessment Feedback.

Recommendation
Clarity around marking in the given time and students writing within the word limit.

Feedback from Moodle and CQU success metrics.

Feedback
Student Engagement.

Recommendation
Continue to encourage students to participate in Learning Community Groups to develop a social presence.

Feedback from Unit coordinator observation and comment from assessment markers.

Feedback
Student assessment writing.

Recommendation
Further support will be provided to students in editing their assessment tasks before submission.

Feedback from DataSmart evaluations

Feedback
Campus students

Recommendation
Encourage campus students to be more proactive in their involvement in their LCG.

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 assessing student learning
2. Assess students' understanding of the mathematical content to identify possible misconceptions or barriers to learning for diverse student groups
3. Distinguish evidence-based approaches to teaching and learning of mathematics that promote engagement, understanding and mathematical proficiency for students from diverse backgrounds including Aboriginal and Torres Strait Islander students
4. Design tools and 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

— N/A Level | ◦ Introductory Level | • Intermediate Level | • Graduate Level | ◦ Professional Level | ◦ Advanced Level

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	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												

Textbooks and Resources

Textbooks

EDCU13020

Prescribed

Helping Children Learn Mathematics
Edition: 4th (2021)
Authors: Robert Reys
Wiley & Sons
Melbourne , Vic , Australia
ISBN: ISBN : 0-7303-9182-5

View textbooks at the CQUniversity Bookshop

IT Resources

You will need access to the following IT resources:

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

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

- 25 Oct 2021

Module/Topic	Chapter	Events and Submissions/Topic

Week 1 - 08 Jul 2024

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to EDCU13020 Mathematics Curriculum.	eReading list Cavanagh, H. & McMaster, H. (2017). A Specialist Professional Experience Learning Community for Primary Pre-service Teachers Focussed on Mathematical Problem Solving. Mathematics Teacher Education & Development, 19(1), 47–65.	

Week 2 - 15 Jul 2024

Module/Topic	Chapter	Events and Submissions/Topic
Australian Curriculum: Mathematics,	View the Australian Curriculum: Mathematics (v9) website 1. Australian Curriculum: Mathematics 2. Mathematical Proficiency Strands 3. Numeracy Progression 4. General Capabilities: Critical and Creative thinking 5. Australian Curriculum v9 Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated Chapter 2 Helping children learn mathematics with understanding Recommendation 4: Use communication to encourage understanding, p37. Chapter 5 Process of doing mathematics 5.1 Understanding 5.2 Fluency 5.3 Problem solving 5.4 Reasoning 5.5 Communication 5.6 Representations	

Week 3 - 22 Jul 2024

Module/Topic	Chapter	Events and Submissions/Topic

Assessment in Mathematics, Part A	Reys. (2022) Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 4 Enhancing learning and teaching through assessment nad feedback 4.1 Enhancing learning and teaching 4.2 Gathering information on children's learning 4.3 Ways to assess children's learning and dispositions 4.4 Keeping records and communicating about assessments Miller, & Hudson, P. J. (2007). Using Evidence-Based Practices to Build Mathematics Competence Related to Conceptual, Procedural, and Declarative Knowledge. Learning Disabilities Research and Practice, 22(1), 47–57. https://doi.org/10.1111/j.1540-5826.2007.00230.x Read pages 49-54 Definitions of conceptual, procedural and declarative knowledge.

Week 4 - 29 Jul 2024

Module/Topic	Chapter	Events and Submissions/Topic
Assessment in Mathematics, Part B	eReading Clements, D., et al. (1990) Constructivist learning and teaching Protheroe, N. (2007) What does good math instruction look like?	

Week 5 - 05 Aug 2024

Module/Topic	Chapter	Events and Submissions/Topic
Mathematical Pedagogy	Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 2 Helping children learn mathematics with understanding 2.2 Meaningful connections between procedural and conceptual knowledge 2.3 How do children learn mathematics 2.4 How can we help children make sense of mathematics? eReading Boaler, J. et al. (2016) Seeing as Understanding: The importance of Visual Mathematics for our Brain and Learning	*Assessment Task 1 - Written Assessment* (45% weighting) Due 9th August, 11:45pm (AEST) 2024. **Assessment in Mathematics** Due: Week 5 Friday (9 Aug 2024) 11:45 pm AEST

Vacation Week - 12 Aug 2024

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 19 Aug 2024

Module/Topic	Chapter	Events and Submissions/Topic

Professional Learning and Reflective Practices	Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 1 School mathematics in a changing world 1.4 Where can you turn? eReading Lane, R., McMaster, H., Adnum, J., & Cavanagh, M. (2014). Quality reflective practice in teacher education: a journey towards shared understanding.	

Week 7 - 26 Aug 2024

Module/Topic	Chapter	Events and Submissions/Topic
Learner Diversity in Mathematics	Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 2 Helping children learn mathematics with understanding 2.1 How can we support divers learners in our classroom Chapter 3 Planning and teaching 3.5 Meeting the needs of all children eReading Jorgensen, R. (2015) Language, Culture and Access to Mathematics: a Case of one Remote Aboriginal Community	

Week 8 - 02 Sep 2024

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

Week 9 - 09 Sep 2024

Module/Topic	Chapter	Events and Submissions/Topic
Learner Engagement in Mathematics	eReading: Attard, C. (2012) Engagement with mathematics: What does it mean and what does it look like? Boaler, J. et al. (2015) Mathematical Mindsets	

Week 10 - 16 Sep 2024

Module/Topic	Chapter	Events and Submissions/Topic
Numeracy in Mathematics	eReading: 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.	

Week 11 - 23 Sep 2024

Module/Topic	Chapter	Events and Submissions/Topic
Games and Mathematical Thinking	eReading: 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.	

Week 12 - 30 Sep 2024

Module/Topic	Chapter	Events and Submissions/Topic
ICTs and Digital Technologies in Mathematics	eReading Sutherland. (2006). Teaching for Learning Mathematics. Berkshire: McGraw-Hill Education.	*Assessment Task 2 - Reflective Practice Assignment* (45% weighting) Due 4 October, 11:45pm (AEST) 2024. **Engaging Students in Learning Mathematics** Due: Week 12 Friday (4 Oct 2024) 11:45 pm AEST

Review/Exam Week - 07 Oct 2024

Module/Topic	Chapter	Events and Submissions/Topic
		Assessment Task 3 - Peer assessment (10%) Due 11 October, 11:45pm (AEST) 2024 . **Peer assessment** Due: Review/Exam Week Friday (11 Oct 2024) 11:45 pm AEST

Exam Week - 14 Oct 2024

Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

Students in the unit will be enrolled in Learning Community Groups (LCG). These groups will operate on the MSTEAMS platform. Students are expected to engage with their LCG members through online chats. Assessment Task 2 is group task that requires students to work in the LCGs to support each other in their assessment task development and present a report to the LCG members which is reviewed and evaluated. Assessment Task 3 is a peer-evaluation completed by each LCG member of other LCG members engagement in the LCG throughout the term.

Assessment Tasks

1 Assessment in Mathematics

Assessment Type
Written Assessment

Task Description
This task requires students to examine the relationship between curriculum, pedagogy and assessment. Students will research and apply knowledge and understanding of mathematics curriculum, pedagogy and assessment to demonstrate their understanding of how students' learn mathematics.
In this task, students are to create an authentic mathematical activity that embeds student assessment. In the activity, students' will **address a mathematical concept chosen from a** given content description from the Australian Curriculum: Mathematics (v9). The mathematical activity will consist of a pedagogical strategy that engages students in their learning and embeds assessment as, for, and of learning in the activity, and a diagnostic assessment component to identify learners' entry level to the mathematical concept. The pedagogical strategy used in the activity **must**

acknowledge the Australian Curriculum's mathematical proficiencies and the general capabilities.
Within this assessment, the use of Generative Artificial Intelligence agents (Gen AI) is as follows:

- Gen AI content is used to generate ideas and general structures.
- Gen AI can be used for content editing.
- Gen AI content generation for you to critique and review.

Assessment Due Date
Week 5 Friday (9 Aug 2024) 11:45 pm AEST

Submit as one word document on the Moodle AT1 submission site

Return Date to Students
Week 8 Monday (2 Sept 2024)

Manuscript returned with tracked changes and the completed criteria sheet

Weighting
45%

Assessment Criteria

1. Knowledge and understanding of mathematical content in the Australian Curriculum: Mathematics.
2. Ability to create a mathematical activity that employs a pedagogical strategy to notice mathematical thinking and engages students in learning mathematical content.
3. Ability to embed assessment as, for, and of learning mathematical content, including a diagnostic component in a mathematical activity.
4. Reflective practice demonstrating professional learning of mathematical content and pedagogical knowledge.
5. Write a clear and coherent narrative with attention to spelling, punctuation, and grammar, in an academic style using APA7 format and referencing procedures.

Referencing Style

- American Psychological Association 7th Edition (APA 7th edition)

Submission
Online

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 assessing student learning
- Assess students' understanding of the mathematical content to identify possible misconceptions or barriers to learning for diverse student groups
- Distinguish evidence-based approaches to teaching and learning of mathematics that promote engagement, understanding and mathematical proficiency for students from diverse backgrounds including Aboriginal and Torres Strait Islander students
- Design tools and guides for assessing students' knowledge and skills in Mathematics
- 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.

2 Engaging Students in Learning Mathematics

Assessment Type
Reflective Practice Assignment

Task Description
This task aims to enhance the students knowledge of the Australian Curriculum: Mathematics, and demonstrate their understanding and disposition of teaching and learning mathematics.

This task requires the student to investigate and address the barriers and misconceptions relating to a mathematical concept chosen from a content descriptor of the Australian Curriculum: Mathematics (v9). The student will create an authentic pedagogical strategy, that includes ICT resource, aimed at overcoming the barriers and misconceptions to learning the mathematical concept. The results of the investigation will be showcased through a professional learning report presented to the Learning Community Group.

All Learning Community Group members critique, give feedback and evaluate the presenting student's report. The feedback received from the LCG is to be used in the *written submission*.

The report presentation is not submitted for marking.

The *written submission* of this assessment will consist of written report, in an academic style of writing, of the chosen mathematical concept in their presentation. Students will critique the research evidence and respond to the feedback received in the Learning Community Group that framed their understanding and disposition of teaching and learning mathematics that addresses the components of the task description from the Moodle site.
Within this assessment, the use of Generative Artificial Intelligence agents (Gen AI) is as follows:

- Gen AI content is used to generate ideas and general structures.
- Gen AI can be used for content editing.
- Gen AI content generation for you to critique and review.

Assessment Due Date
Week 12 Friday (4 Oct 2024) 11:45 pm AEST

Submit as one word document on the Moodle AT2 submission site.

Return Date to Students

Weighting
45%

Assessment Criteria

1. Demonstrates knowledge and understanding of the Australian Curriculum: Mathematics and a productive disposition towards teaching mathematics.
2. Investigates mathematical misconceptions and barriers relating to learning mathematical content that addresses the needs of all students.
3. Discusses various resources that promotes students' mathematical thinking, engagement and conceptual understanding
4. Designs an appropriate pedagogical strategy that includes an ICT resource that engage students in learning mathematics.
5. Describes the reflective practice experience to support professional learning experiences that improve teaching practice and student learning.
6. Write a clear and coherent narrative with attention to spelling, punctuation, and grammar, in an academic style using APA7 format and referencing procedures.

Referencing Style

- American Psychological Association 7th Edition (APA 7th edition)

Submission
Online

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 assessing student learning
- Assess students' understanding of the mathematical content to identify possible misconceptions or barriers to learning for diverse student groups
- Distinguish evidence-based approaches to teaching and learning of mathematics that promote engagement, understanding and mathematical proficiency for students from diverse backgrounds including Aboriginal and Torres Strait Islander students
- Design tools and 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
- 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.

3 Peer assessment

Assessment Type
Peer assessment

Task Description
This assessment task involves each student assessing other members of their Learning Community Group (LCG) members based on their participation in the LCG during the term and the feedback given on AT2.

Assessment Due Date
Review/Exam Week Friday (11 Oct 2024) 11:45 pm AEST

Submission completed on Self and Peer Assessment (SPA) application.

Return Date to Students

Weighting
10%

Assessment Criteria
The ten criteria questions are:

1. Was regular in attending Learning Community Group meetings.
2. Contributed positively to Learning Community Group discussions.
3. Completed shared work on time or made alternative arrangements.
4. Helped others with their work when needed.
5. Did work accurately and completely.
6. Met time deadlines decided by the Learning Community Group.
7. Worked well with other Learning Community Group members.
8. Overall was a valuable member of the Learning Community Group.
9. Gave productive feedback in Assessment Task 2.
10. Gave feedback to Assessment Task 2 in a timely manner.

Referencing Style

- American Psychological Association 7th Edition (APA 7th edition)

Submission
Online

Submission Instructions
Evaluations are completed on the Moodle SPA application

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 assessing student learning
- Assess students' understanding of the mathematical content to identify possible misconceptions or barriers to learning for diverse student groups
- Reflect on professional learning to describe processes and strategies that improve teaching practice and student learning

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