



# ECHE4310

## Teaching and Learning Mathematics

Session 1, In person-scheduled-infrequent, North Ryde 2023

*Macquarie School of Education*

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#### Disclaimer

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## General Information

Unit convenor and teaching staff

Convenor, Lecturer, Tutor

Laurinda Lomas

[laurinda.lomas@mq.edu.au](mailto:laurinda.lomas@mq.edu.au)

Contact via email

Room 272, 29 Wally's Walk

By appointment

Credit points

10

Prerequisites

130cp including ECH335 or ECHE2340 or ECHE234

Corequisites

Co-badged status

Unit description

This unit builds on the knowledge gained in previous units, further developing student's knowledge of the principles and practices of teaching and learning mathematics. Students explore a range of strategies for assessing children's mathematical understandings, and design and implement lesson sequences to enhance the growth of children's mathematical thinking. The integration of technology with mathematics and with other Key Learning Areas, including differentiating curriculum to meet the diverse needs of learners, is also addressed.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

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

**ULO1:** Develop further understanding of the major theoretical and research directions and current issues in mathematics education.

**ULO2:** Design lesson sequences that enhance the growth of children's mathematical thinking, reflect current issues in research and integrate other areas of curriculum.

**ULO3:** Demonstrates knowledge of mathematical concepts and processes in the areas of number and algebra, statistics and probability, measurement and geometry and

working mathematically.

**ULO4:** Demonstrates research based knowledge of teaching and learning approaches to differentiating curriculum to meet the diverse needs of learners in the mathematics classroom.

**ULO5:** Demonstrates effective mathematics teaching and learning strategies for meeting the needs of Indigenous students.

**ULO6:** Demonstrates a capacity to use software for student profiling and reporting, lesson preparation and general administrative tasks.

**ULO7:** Develop and awareness of the range of application and adaptive technologies available to support students with special needs.

## General Assessment Information

- Students should be aware of and apply the University policy on academic honesty (see: <https://policies.mq.edu.au/document/view.php?id=3>)
- Unless a Special Consideration (see: <https://students.mq.edu.au/study/assessment-exams/special-consideration>) request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a mark of, 0 (zero) will be awarded even if the assessment is submitted. Submission time for all written assessments is set at 11.55pm. A 1-hour grace period is provided to students who experience a technical issue.
- This late penalty will apply to non-timed sensitive assessment (incl essays, reports, posters, portfolios, journals, recordings etc). Late submission of time sensitive tasks (such as tests/exams, performance assessments/presentations, scheduled practical assessments/labs etc) will only be addressed by the unit convenor in a Special consideration application. Special Consideration outcome may result in a new question or topic.
- Please format assessments using 12-point font and 1.5 spacing.
- All assessments are submitted electronically. Turnitin plagiarism detection software is used to check all written assessments.
- Students can use Turnitin's Originality Report as a learning tool to improve their academic writing if this option is made available in the unit.
- Students should carefully check that they submit the correct file for an assessment as no

re-submissions will be accepted after the due date and time, including instances where students upload an incorrect file in error.

- Word limits are strictly applied. Work above the word limit will not be marked.
- All assessments are marked using a rubric.
- Marking of all assessments is moderated by the Unit Convenor.
- Applications for extensions must be made via AskMQ (<https://ask.mq.edu.au/>).
- It is not the responsibility of unit staff to contact students who have failed to submit assessments. If you have any missing items of assessment, it is your responsibility to make contact with the unit convenor.
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## University policy on grading

Criteria for awarding grades for assessment tasks

Assignments will be awarded grades ranging from HD to F according to guidelines set out in the University's Grading Policy. For Professional Experience units the PE Report is marked as satisfactory or unsatisfactory and the Teaching Performance Assessment (in final PE units) is marked as not meets, meets or exceeds. The following descriptive criteria are included for your information.

Descriptive Criteria for awarding grades in the unit

In order to meet the unit outcomes and successfully pass this unit, students must make a genuine attempt at all assessment tasks. Where any submitted assessment task is considered to be unsatisfactory in this regard, the highest possible final grade that can be awarded for the unit will be 45

Grade	Descriptor
<b>HD</b> (High Distinction)	Provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality and insight in identifying, generating and communicating competing arguments, perspectives or problem-solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application as appropriate to the discipline.
<b>D</b> (Distinction)	Provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the discipline and the audience.

<b>Cr</b> (Credit)	Provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; convincing argumentation with appropriate coherent justification; communication of ideas fluently and clearly in terms of the conventions of the discipline.
<b>P</b> (Pass).	Provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the field of study; routine argumentation with acceptable justification; communication of information and ideas adequately in terms of the conventions of the discipline. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes
<b>F</b> (Fail)	Does not provide evidence of attainment of learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of study; missing, undeveloped, inappropriate or confusing argumentation; incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the discipline.

Note: *If you fail a unit with a professional experience component, the fail grade will be on your transcript irrespective of the timing of the placement.*

### Withdrawing from this unit

If you are considering withdrawing from this unit, please seek academic advice via <https://ask.mq.edu.au> before doing so as this unit may be a co-requisite or prerequisite for units in the following sessions and may impact on your course progression.

### Results

Results shown in iLearn, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](https://ask.mq.edu.au).

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Report and learning plans</a>	40%	No	23:55 29/03/23
<a href="#">Presentation</a>	20%	No	23:55 05/04/23
<a href="#">Mathematics and diverse learners</a>	40%	No	23:55 31/05/23

### Report and learning plans

Assessment Type <sup>1</sup>: Report

Indicative Time on Task <sup>2</sup>: 24 hours

Due: **23:55 29/03/23**

Weighting: **40%**

2000 words Students identify key issues from research and develop a summary to support teaching

On successful completion you will be able to:

- Develop further understanding of the major theoretical and research directions and current issues in mathematics education.
- Design lesson sequences that enhance the growth of children's mathematical thinking, reflect current issues in research and integrate other areas of curriculum.
- Demonstrates knowledge of mathematical concepts and processes in the areas of number and algebra, statistics and probability, measurement and geometry and working mathematically.
- Demonstrates research based knowledge of teaching and learning approaches to differentiating curriculum to meet the diverse needs of learners in the mathematics classroom.
- Demonstrates a capacity to use software for student profiling and reporting, lesson preparation and general administrative tasks.
- Develop and awareness of the range of application and adaptive technologies available to support students with special needs.

## Presentation

Assessment Type **1**: Presentation

Indicative Time on Task **2**: 12 hours

Due: **23:55 05/04/23**

Weighting: **20%**

2 Pages Working with a group of fellow students to develop a presentation that relates to diverse learning and mathematics

On successful completion you will be able to:

- Develop further understanding of the major theoretical and research directions and current issues in mathematics education.
- Demonstrates knowledge of mathematical concepts and processes in the areas of

number and algebra, statistics and probability, measurement and geometry and working mathematically.

- Demonstrates research based knowledge of teaching and learning approaches to differentiating curriculum to meet the diverse needs of learners in the mathematics classroom.
- Demonstrates effective mathematics teaching and learning strategies for meeting the needs of Indigenous students.

## Mathematics and diverse learners

Assessment Type <sup>1</sup>: Essay

Indicative Time on Task <sup>2</sup>: 24 hours

Due: **23:55 31/05/23**

Weighting: **40%**

2000 words. Essay on meeting diverse learning needs in mathematics

On successful completion you will be able to:

- Demonstrates research based knowledge of teaching and learning approaches to differentiating curriculum to meet the diverse needs of learners in the mathematics classroom.
- Demonstrates effective mathematics teaching and learning strategies for meeting the needs of Indigenous students.
- Develop and awareness of the range of application and adaptive technologies available to support students with special needs.

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<sup>1</sup> If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

<sup>2</sup> Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

## Delivery and Resources

### Required and recommended texts

Siemon, D., Warren, E, Beswick, K., Faragher, R., Miller, J., Horne, M., Jazby, D., & Breed,

**M. (2021). *Teaching mathematics: Foundation to middle years* (3rd ed.). South Melbourne: Oxford University Press.**

If you have the 2015 edition of the above text, please use that one rather than buying the new edition.

### **Information about the unit iLearn site**

**This unit has a full web presence through *iLearn*.**

**Students will need regular access to a computer and the Internet to complete this unit.**

Weekly access to iLearn is compulsory for all students. Important assessment information will be posted here, as will other relevant unit notices and materials, including a reading template and guide to lecture note taking to assist your studies.

Various activities and materials for discussion and critical reflection are included and external students especially are encouraged to use this web component. Electronic links and suggested references will be included in the Resources section. Please check the iLearn unit regularly.

Weekly lectures are available on the web through the ECHO360 lecture component. You must listen to all lectures.

PowerPoint slides are available in iLearn.

### **Access and technical assistance**

Information for students about access to the online component of this unit is available at <https://ilearn.mq.edu.au/login/index.php>. You will need to enter your student username and password.

Please do **NOT** contact the Unit Convenor regarding *iLearn* technical help.

Assistance is available from IT Helpdesk

Ph: 9850 4357 or 1800 67 4357

Email: [help.mq.edu.au](mailto:help.mq.edu.au).

On Campus: Ground floor at 18 Wally's Walk.

### **Structure**

The unit structure can be found in the university timetable <https://timetables.mq.edu.au/2023/> In the tutorial students will discuss issues and questions arising from the lectures and prescribed readings. They are expected to base their arguments/discussions on evidence from published research and other relevant material. There will be a supporting iLearn site for the unit providing additional readings, links and materials.

### **Unit Structure**

The unit comprises a 1 hour lecture per week for 10 weeks and 2 On Campus Day tutorials. In the tutorials, students will discuss issues and questions arising from the lectures and prescribed readings and undertake a variety of hands-on activities. Prescribed readings are listed on iLearn as part of the schedule. Lectures will be available through iLearn from the following website link: <http://ilearn.mq.edu.au>



Tutorials will be scheduled in 'blocks' during 2 on campus days (OCD). Please see the iLearn unit site for dates, times and locations.

**The weekly program for the course with the accompanying readings/ preparation is available on the iLearn unit site.**

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies](https://students.mq.edu.au/support/study/policies) (<https://students.mq.edu.au/support/study/policies>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>) and use the [search tool](#).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

## Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](https://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

## School of Education Procedures

In addition, the following policies and procedures of the School of Education are applicable in this unit.

### Infrequent Attendance Students

Information about the dates of the on-campus sessions can be found in the university timetable.

<https://timetables.mq.edu.au/2023/>

- The on-campus sessions are essential to student engagement and learning and attendance on all days is expected. Failure to attend or to have an approved Special Consideration may result in a Fail grade for the unit. Please see attendance requirements in this unit guide.
- Prior to the on-campus sessions, you should have read the prescribed readings and listened to the lectures. Summarise the main points and make a note of the key terms and definitions. Prepare any discussion questions of your own that you wish to share.
- Please make effective use of the online component of the unit and access iLearn regularly. Keep up to date with listening to the lectures on a weekly basis.
- Further specific details and any updates about times and locations will be posted on iLearn as an Announcement during first half of the semester.

## Electronic Communication

It is the student's responsibility to check all electronic communication on a regular weekly basis. Communication may occur via:

- Official MQ Student Email Address
- The Dialogue function on iLearn
- Other iLearn communication functions

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

### The Writing Centre

[The Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)

- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

## Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Changes from Previous Offering

This unit is only offered in infrequent mode in 2023.

## 5Rs Framework

The 5Rs Framework, developed by the School of Education at Macquarie University, is embedded throughout your teacher education course. This helps our graduates to be:

1. Resilient
2. Reflexive in their teaching practice
3. Responsive to children, colleagues, parents, professionals and communities

4. Ready to learn, and

5. Research engaged

Your use of the 5Rs Framework will help you develop the capabilities that will make your teaching career sustainable and fulfilling.

In this unit, you will learn using the 5Rs framework in the following important ways:

**Reflexive:** Constant reflection on your mathematical teaching practice and how it attends to the needs of a diverse range of learners

**Research engaged:** Using current research to inform your decisions, planning and practice to meet the needs of all students in the primary mathematics classroom