

# EDST6726

Extension Mathematics Method 1

Term 1, 2022



## Course Overview

### Staff Contact Details

#### Convenors

Name	Email	Availability	Location	Phone
Mark Goreta	<a href="mailto:m.goreta@student.unsw.edu.au">m.goreta@student.unsw.edu.au</a>			

### School Contact Information

School of Education  
Arts, Design and Architecture  
Ground Floor, Morven Brown Building (F20)

**T:** +61 (2) 9385 1977

**E:** [education@unsw.edu.au](mailto:education@unsw.edu.au)

**W:** <https://www.arts.unsw.edu.au/education>

## Acknowledgement of Country

UNSW Arts, Design and Architecture Kensington and Paddington campuses are built on Aboriginal Lands. We pay our respects to the Bidjigal and Gadigal peoples who are the Custodians of these lands. We acknowledge the Aboriginal and Torres Strait Islander peoples, the First Australians, whose lands, winds and waters we all now share, and pay respect to their unique values, and their continuing and enduring cultures which deepen and enrich the life of our nation and communities.



Image courtesy of the Office of the Pro Vice-Chancellor Indigenous [UNSW's Indigenous strategy](#)

## Course Details

### Units of Credit 6

### Workload

150 hours including class contact hours, readings, class preparation, assessment, follow up activities, etc.

### Summary of the Course

*This is a hybrid course. It is available to both undergraduate and postgraduate students. The course content, delivery and assessment will be identical for both groups of students.*

This course is designed to increase a student's pedagogical content knowledge for Mathematics teaching. The key elements of pedagogy and Mathematics content knowledge are examined and developed. Students will critically address how these elements can then be combined into effective classroom practice for addressing the requirements and philosophy of the NSW Mathematics syllabuses.

### Course Learning Outcomes

1. Demonstrate knowledge and understanding of the NSW Board of Studies Mathematics Syllabuses for stages 4/5 and stage 6 and extension Mathematics.
2. Demonstrate the essential link between outcomes, assessment, teaching strategies and lesson planning.
3. Discuss classroom strategies that recognize students different approaches to learning.
4. Analyse specific assessment strategies for a diverse range of students
5. Develop appropriate and engaging resources for the Mathematics classroom that take into account students skills, interests and prior achievements and that respect the social, ethnic and religious backgrounds of students.

### Australian Professional Standards for Teachers

Standard		Assessment/s
1.2.1	Demonstrate knowledge and understanding of research into how students learn and the implications for teaching.	1, 2
1.3.1	Demonstrate knowledge of teaching strategies that are responsive to the learning strengths and needs of students from diverse linguistics, cultural, religious, and socioeconomic backgrounds.	1, 2
2.1.1	Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area.	1, 2, 3
2.4.1	Demonstrate broad knowledge of, understanding of and respect for Aboriginal and Torres strait Islander histories, cultures, and languages.	1, 2
2.5.1	Know and understand literacy and numeracy teaching strategies and their application in teaching areas.	1, 2

2.6.1	Implement teaching strategies for using ICT to expand curriculum learning opportunities for students.	1, 2
3.3.1	Include a range of teaching strategies.	1, 2
3.4.1	Demonstrate knowledge of a range of resources including ICT that engage students in their learning.	1, 2, 3

### National Priority Area Elaborations

	Priority area		Assessment/s
A	Aboriginal and Torres Strait Islander Education	1-9	1, 2, 3
B	Classroom Management	1-5	1, 2
C	Information and Communication Technologies	1-6	2, 3
D	Literacy and Numeracy	1-19	1, 2, 3

### Teaching Strategies

Please refer to the information in Moodle

## Assessment

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Designing an Assessment Task	30%	Friday 25/3/2022	1, 2, 3, 4, 5
2. Using Computer Based Technology	40%	Friday 29/4/2022	1, 4, 5
3. Content and pedagogical knowledge quiz	30%	Weeks 4,7,10	1, 2

### Assessment 1: Designing an Assessment Task

**Due date:** Friday 25/3/2022

Construct a rich assessment task for Stage 4 or 5 NSW mathematics syllabus, including differentiation strategies. Length: Up to 2000 words

#### Additional details

Construct a 20-minute rich assessment task for a topic/s from the Stage 4 or 5 NSW Mathematics syllabus using your ICT skills to present it.

- The assessment should be a written assessment task (e.g., it can be an end of unit test or an assessable project).
- Identify all NSW syllabus *outcomes* in the task and show how they are linked to the questions in the assessment.
- You will need a written reflection to explain why you think it is a good assessment and how you would modify this task to meet the needs of your students (differentiation). You must avoid giving your own opinion without any backing from research literature on assessments in Mathematics.
- Explain how the WM proficiencies are being used in the task.
- Explain and justify whether your task is Assessment for learning, Assessment of learning or Assessment as learning.
- Explain how you could use this task to inform your teaching.
- Include solutions and justify your marking criteria for this task.
- Include a rubric for the task.
- Word counts for such assessments may vary greatly. If you are unsure about this aspect, please email me for further clarification.

### Assessment 2: Using Computer Based Technology

**Due date:** Friday 29/4/2022

Explain how you would use a computer based mathematical tool (e.g. GeoGebra, Autograph, MS Excel) to help a Stage 5 or Stage 6 (Prelim) students learn a particular mathematical concept. The task includes ICT instructions and differentiation strategies. Length: 2,500 words

#### Additional details

Explain how you would use a computer-based mathematical tool (e.g., Geogebra, Autograph, MSExcel, Wolfram Alpha, Desmos, Geometer's Sketchpad etc.) to help students learn a particular mathematical concept from the Stage 5 or Stage 6 (Mathematics Advanced or Mathematics Standard **Year 11 only**).

- Identify a mathematical concept that you wish to teach using technology as an aide.
- Identify all the NSW syllabus outcomes in the task and show how they are linked to the activity.
- Include an instruction worksheet for students to use for this activity using your ICT skills.
- Include a lesson plan (see SED template). Include a detailed introduction to engage your students, enabling prompts and extending questions in your lesson plan.
- You will need a written annotation to explain how the technology nominated in your task assists the students in better understanding the chosen concept. You must also identify how you would modify this task to meet the needs of your students (differentiation) as well as how you would carry out assessment for learning (AfL) in the process. Avoid giving your own opinion without any backing from research literature.
- Demonstrate your concept electronically (e.g., using "show me" app or video link etc.) so that a student who has missed the lesson could understand the new concept by being sent the link (see flipped classrooms). Be prepared to share this with your fellow preservice teachers.

### **Assessment 3: Content and pedagogical knowledge quiz**

**Due date:** Weeks 4,7,10

Complete a series of short answer quizzes based on mathematics content and curriculum knowledge

#### **Additional details**

You will complete a series of short answer quizzes (30%) in weeks 4,7,11. The quizzes will be based on Mathematics content in all Stages, lectures and/or readings in this course.

# RUBRIC/FEEDBACK SHEET

## EDST6726 EXTENSION MATHEMATICS METHOD 1

### UNSW SCHOOL OF EDUCATION

#### Assessment Task 1: Designing an Assessment Task

Specific Criteria	(-)—————>(+)				
<p><b>Understanding of the question or issue and the key concepts involved</b></p> <ul style="list-style-type: none"> <li>• Understanding of the task and its relationship to relevant areas of theory, research, and practice</li> <li>• Rationale linked to outcomes in the syllabus</li> <li>• Show evidence of critical analysis and reflection</li> </ul>					
<p><b>Depth of analysis and critique in response to the task</b></p> <ul style="list-style-type: none"> <li>• Ability to plan and assess for effective learning by designing an assessment task, marking criteria and rubric using knowledge of the NSW syllabus documents or other curriculum requirements of the education act</li> <li>• Reasons for the choice of questions and why it is a good task effectively explained</li> <li>• Demonstration of knowledge, respect and understanding of the social, ethnic, cultural, and religious backgrounds of students and how these factors may affect learning</li> <li>• Demonstrates knowledge of resources that will engage and extend all students</li> <li>• Clear statement of syllabus outcomes</li> <li>• Assessment/Task goal(s) clearly linked to syllabus outcomes and chosen strategies</li> <li>• Correct use of Mathematical terminology</li> <li>• Syllabus related terminology clearly explained and justified appropriately</li> </ul>					
<p><b>Familiarity with and relevance of professional and/or research literature used to support response</b></p>					



Specific Criteria	(-)—————>(+)				
<ul style="list-style-type: none"> <li>Reference specifically to material, research and ideas presented in method lectures, readings from the prescribed text and other sources, relevant lectures from the combined method lecture series and from the professional experience lectures on diversity</li> </ul>					
<b>Structure and organisation of response</b>					
<b>Presentation of response according to appropriate academic and linguistic conventions</b>					
<b>General comments/recommendations for next time:</b>					

**Recommended:                    /20 (FL PS CR DN HD)                    Weighting:                    30%**

NB: The ticks in the various boxes are designed to provide feedback to students; they are not given equal weight in determining the recommended grade. Depending on the nature of the assessment task, lecturers may also contextualise and/or amend these specific criteria. The recommended grade is tentative only, subject to standardisation processes and approval by the School of Education Learning and Teaching Committee.

**RUBRIC/FEEDBACK SHEET**  
**EDST6726 EXTENSION MATHEMATICS METHOD 1**  
**UNSW SCHOOL OF EDUCATION**

**Assessment Task 2: Using Computer Based Technology**

Specific Criteria	(-)—————>(+)				
<p><b>Understanding of the question or issue and the key concepts involved</b></p> <ul style="list-style-type: none"> <li>• Understanding of the task and its relationship to relevant areas of theory, research, and practice</li> <li>• Rationale linked to outcomes in the syllabus</li> <li>• Show evidence of critical analysis and reflection</li> </ul>					
<p><b>Depth of analysis and critique in response to the task</b></p> <ul style="list-style-type: none"> <li>• Ability to plan and assess for effective learning by designing a detailed lesson on the proforma, using knowledge of the NSW syllabus documents or other curriculum requirements of the education act</li> <li>• Reasons for the choice of teaching and learning strategies effectively explained</li> <li>• Demonstration of knowledge, respect and understanding of the social, ethnic, cultural, and religious backgrounds of students and how these factors may affect learning</li> <li>• Demonstrates knowledge of resources that will engage and extend all students</li> <li>• Clear statement of syllabus outcomes</li> <li>• Lesson/Task goal(s) clearly linked to syllabus outcomes and chosen strategies</li> <li>• Correct mathematical terminology</li> <li>• Correct use of syllabus related terminology</li> </ul>					
<p><b>Familiarity with and relevance of professional and/or research literature used to support response</b></p>					

Specific Criteria	(-)—————>(+)				
<ul style="list-style-type: none"> <li>Reference specifically to material, research and ideas presented in method lectures, readings from the prescribed text and other sources, relevant lectures from the combined method lecture series and from the professional experience lectures on diversity</li> </ul>					
<b>Structure and organisation of response</b>					
<b>Presentation of response according to appropriate academic and linguistic conventions</b>					
<b>General comments/recommendations for next time:</b>					

**Recommended:                    /20 (FL PS CR DN HD)                    Weighting:                    40%**

NB: The ticks in the various boxes are designed to provide feedback to students; they are not given equal weight in determining the recommended grade. Depending on the nature of the assessment task, lecturers may also contextualise and/or amend these specific criteria. The recommended grade is tentative only, subject to standardisation processes and approval by the School of Education Learning and Teaching Committee.

# Attendance Requirements

## School of Education Attendance Requirement

The School of Education (SED) requires students meet a minimum attendance requirement of 80% of all scheduled classes (i.e. lectures, tutorials, workshops, seminars) for all courses. Attendance in person is required for tutorials, seminars, and workshops when courses are delivered in face-to-face mode. It is the responsibility of students to ensure that their attendance is recorded for the face-to-face either by electronic means or via an attendance register. Attendance in online or blended mode will be assessed through digital. Further information can be found [here](#).

## Course Schedule

[View class timetable](#)

### Timetable

Date/Module	Type	Content
1	Lecture	<b>What is Mathematics?</b> <ul style="list-style-type: none"><li>• What has changed in Mathematics Education in recent years?</li><li>• What is expected of Mathematics teachers today?</li></ul>
	Tutorial	<ul style="list-style-type: none"><li>• Stage 4 – 6 Mathematics Syllabus in the Continuum of K-12</li><li>• Where can you find resources?</li><li>• What professional networks are/is there to help you?</li></ul>
2	Lecture	<b>Meeting the needs of all students</b> <ul style="list-style-type: none"><li>• Teaching a class with students of varying ability</li><li>• Streaming in a subject with sequential content – what options may be available?</li></ul>
	Tutorial	<ul style="list-style-type: none"><li>• Planning lessons &amp; units of work using ideas from the lecture</li></ul>
3	Lecture	<b>Lesson Starters and Rich Tasks</b> <ul style="list-style-type: none"><li>• Analysing lesson structure and content</li><li>• Using 'rich' tasks as assessment tools</li><li>• Working Mathematically (NESA)</li><li>• What is considered best practice today?</li></ul>
	Tutorial	<ul style="list-style-type: none"><li>• Writing Assessments (Planning for Assessment 1)</li></ul>

4	Lecture	<b>Teaching with 'Technology'</b>  <ul style="list-style-type: none"> <li>e.g., Geogebra, Desmos, Mathspace, Edrolo, Adusu Algebra</li> </ul>
	Tutorial	<ul style="list-style-type: none"> <li>Keeping students on task in a BYOD classroom</li> <li><b>Class Quiz</b></li> </ul>
5	Lecture	<b>High Performing Students</b>  Developing their ICT and/or thinking skills
	Tutorial	<ul style="list-style-type: none"> <li>Catering for gifted students</li> </ul>
6	Lecture	<b>Stage 6 Mathematics Standard Course Overview</b>
	Tutorial	<ul style="list-style-type: none"> <li>Role of NAPLAN</li> </ul>
7	Lecture	<b>Stage 6 Mathematics Standard Course</b>  <ul style="list-style-type: none"> <li>Further Planning lessons &amp; units of work</li> </ul> <b>General Feedback from Assessment 1</b>
	Tutorial	<ul style="list-style-type: none"> <li><b>Class Quiz</b></li> </ul>
8	Lecture	<b>Week 8 Method Break</b>
	Tutorial	<b>Week 8 Method Break</b>
9	Lecture	(Online, F2F, asynch)  <b>Stage 6 HSC Mathematics Advanced Course overview</b>  <ul style="list-style-type: none"> <li>Teaching for understanding and application</li> </ul>
	Tutorial	<ul style="list-style-type: none"> <li>The use of technology in teaching for understanding (Planning for Assessment 2)</li> </ul>
10	Lecture	<b>Stage 6 HSC Mathematics Advanced Courses</b>
	Tutorial	<ul style="list-style-type: none"> <li>Teaching for understanding and application</li> </ul>
11	Lecture	<b>Preparation for Professional Experience</b>  <ul style="list-style-type: none"> <li>Managing the mathematics classroom</li> <li>Maintaining student engagement</li> <li>Observing lessons and reflecting on</li> </ul>

		classroom practice
	Tutorial	<ul style="list-style-type: none"><li>• MyExperience on-line course evaluation</li><li>• <b>Class Quiz</b></li></ul>

## Resources

### Prescribed Resources

#### Required Texts

- Cavanagh, M. & Prescott, A. (2014). *Your professional experience handbook: A guide for preservice teachers*. Sydney: Pearson.
- Goos, M., Stillman, G., & Vale, C. (2016). *Teaching secondary school mathematics: Research and practice for the 21st century*. Sydney: Allen & Unwin
- NSW Board of Studies Stage 4, 5 & 6 Syllabuses  
<http://educationstandards.nsw.edu.au/wps/portal/nesa/home>
- Australian Curriculum Documents for NSW Stage 4 and Stage 5

#### Required Readings

- Anstey, M. & Bull, G. (2006) *Teaching and learning multiliteracies: Changing times, changing literacies*. Curriculum Press, Melbourne.
- Attwood, B. (2005), *Telling the truth about Aboriginal history*. Allen & Unwin, Crows Nest.
- Boaler, J. (2010). *The Elephant in the Classroom: How to teach kids learn and love mathematics*
- Finger, G., Russell, G., Jamieson-Proctor, R. & Russell, N. (2006) *Transforming Learning with ICT Making IT Happen*. Pearson Australia
- Gibbons, P (2002) *Scaffolding language, scaffolding learning: Teaching second language learners in the mainstream classroom*. Portsmouth, Heinemann.
- Henderson, R. (2012). *Teaching Literacies. Pedagogies and Diversity in the Middle Years*, Oxford University Press, Australia
- Hyde, M., Carpenter, L. & Conway, R. (2010). *Diversity and Inclusion in Australian Schools*. Oxford University Press, Australia
- Jones, K. and Smith, K. (1997), Student Teachers Learning to Plan Mathematics Lessons. Paper presented at the 1997 Annual Conference of the Association of Mathematics Education Teachers (AMET1997). Leicester. 15-17 May 1997
- Martin, K. (2008). The intersection of Aboriginal knowledges, Aboriginal literacies and new learning pedagogy for Aboriginal students. In Healy, A (Ed.) *Multiliteracies and diversity in education: New pedagogies for expanding landscapes*. Pp 59-81. Oxford University Press, Melbourne.
- Price, K (2012), *Aboriginal and Torres Strait Islander Education: An Introduction for the Teaching Profession*. Cambridge University Press
- Watson, A., Jones, K., & Pratt, D. (2013). *Key Ideas in Teaching Mathematics: Research-based Guidance for Ages 9-19*. Oxford University Press. Also available as an iBook or on Kindle.

### Recommended Resources

#### Recommended Websites

Students can download syllabuses from the NESA website  
<http://educationstandards.nsw.edu.au/wps/portal/nesa/home>

<https://education.nsw.gov.au/>

<http://libguides.csu.edu.au/HSC/math>

[www.cecnsw.catholic.edu.au](http://www.cecnsw.catholic.edu.au)

[www.curriculum.edu.au](http://www.curriculum.edu.au)

[www.curriculumsupport.education.nsw.gov.au](http://www.curriculumsupport.education.nsw.gov.au)

[www.aboriginaleducation.nsw.edu.au/index.html](http://www.aboriginaleducation.nsw.edu.au/index.html)

[www.nswteachers.nsw.edu.au](http://www.nswteachers.nsw.edu.au)

[www.mansw.nsw.edu.au](http://www.mansw.nsw.edu.au)

[www.aamt.com.au](http://www.aamt.com.au)

[www.hsc.csu.edu.au](http://www.hsc.csu.edu.au)

[www.tes.co.uk/teaching-resources](http://www.tes.co.uk/teaching-resources)

[www.desmos.com](http://www.desmos.com)

[www.merga.net.au](http://www.merga.net.au)

[www.geogebra.org](http://www.geogebra.org)

[www.scootle.edu.au](http://www.scootle.edu.au)

<https://mathslinks.net/>

<http://nrich.maths.org/>



## **Submission of Assessment Tasks**

### **Turnitin Submission**

If you encounter a problem when attempting to submit your assignment through Turnitin, please telephone External Support on 9385 3331 or email them on [externalteltsupport@unsw.edu.au](mailto:externalteltsupport@unsw.edu.au). Support hours are 8:00am – 10:00pm on weekdays and 9:00am – 5:00pm on weekends (365 days a year). If you are unable to submit your assignment due to a fault with Turnitin you may apply for an extension, but you must retain your ticket number from External Support (along with any other relevant documents) to include as evidence to support your extension application. If you email External Support you will automatically receive a ticket number, but if you telephone you will need to specifically ask for one. Turnitin also provides updates on their system status on Twitter.

Generally, assessment tasks must be submitted electronically via either Turnitin or a Moodle assignment. In instances where this is not possible, it will be stated on your course's Moodle site with alternative submission details.

For information on how to submit assignments online via Moodle: <https://student.unsw.edu.au/how-submit-assignment-moodle>

## Academic Honesty and Plagiarism

Plagiarism is using the words or ideas of others and presenting them as your own. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement.

### UNSW groups plagiarism into the following categories:

**Copying:** Using the same or very similar words to the original text or idea without acknowledging the source or using quotation marks. This includes copying materials, ideas or concepts from a book, article, report or other written document, presentation, composition, artwork, design, drawing, circuitry, computer program or software, website, internet, other electronic resource, or another person's assignment without appropriate acknowledgement.

**Inappropriate paraphrasing:** Changing a few words and phrases while mostly retaining the original information, structure and/or progression of ideas of the original without acknowledgement. This also applies in presentations where someone paraphrases another's ideas or words without credit and to piecing together quotes and paraphrases into a new whole, without appropriate referencing.

**Collusion:** Working with others but passing off the work as a person's individual work. Collusion also includes providing your work to another student for the purpose of them plagiarising, paying another person to perform an academic task, stealing or acquiring another person's academic work and copying it, offering to complete another person's work or seeking payment for completing academic work.

**Inappropriate citation:** Citing sources which have not been read, without acknowledging the "secondary" source from which knowledge of them has been obtained.

**Duplication ("self-plagiarism"):** Submitting your own work, in whole or in part, where it has previously been prepared or submitted for another assessment or course at UNSW or another university.

### Correct referencing practices

The [UNSW Academic Skills support](#) offers resources and individual consultations. Students are also reminded that careful time management is an important part of study. One of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and proper referencing of sources in preparing all assessment items.

UNSW Library has [the ELISE tool](#) available to assist you with your study at UNSW. ELISE is designed to introduce new students to studying at UNSW but it can also be a great refresher during your study. Completing the ELISE tutorial and quiz will enable you to:

- analyse topics, plan responses and organise research for academic writing and other assessment tasks
- effectively and efficiently find appropriate information sources and evaluate relevance to your needs
- use and manage information effectively to accomplish a specific purpose
- better manage your time
- understand your rights and responsibilities as a student at UNSW
- be aware of plagiarism, copyright, UNSW Student Code of Conduct and Acceptable Use of UNSW ICT Resources Policy
- be aware of the standards of behaviour expected of everyone in the UNSW community
- locate services and information about UNSW and UNSW Library

## Academic Information

Due to evolving advice by NSW Health, students must check for updated information regarding online learning for all Arts, Design and Architecture courses this term (via Moodle or course information provided.)

For essential student information relating to:

- requests for extension;
- late submissions guidelines;
- review of marks;
- UNSW Health and Safety policies;
- examination procedures;
- special consideration in the event of illness or misadventure;
- student equity and disability;
- and other essential academic information, see

<https://www.unsw.edu.au/arts-design-architecture/student-life/resources-support/protocols-guidelines>

## Image Credit

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## CRICOS

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