School of Education

EDST6755
Mathematics Method 2

Term 2 2021

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IMPORTANT:
For student policies and procedures relating to assessment, attendance and student support, please see website, https://education.arts.unsw.edu.au/students/courses/course-outlines/

The School of Education acknowledges the Bedegal people as the traditional custodians of the lands upon which we learn and teach.

1. LOCATION

Faculty of Arts, Design & Architecture
School of Education
EDST6755 Mathematics Method 2 (6 units of credit)
Term 2 2021

2. STAFF CONTACT DETAILS

Course Coordinator(s):	Yvette Semler
Email:	y.semler@unsw.edu.au
Availability:	By appointment
Tutor:	Janet Hunter
Email:	janet.hunter@unsw.edu.au
Availability:	By appointment

3. COURSE DETAILS

Course Name	Mathematics Method 2
Credit Points	6 units of credit (uoc)
Workload	150 hours including class contact hours, readings, class preparation, assessment, follow up activities, etc.
Schedule	http://classutil.unsw.edu.au/EDST_T2.html#EDST6755T2C

SUMMARY OF THE COURSE

This course is a continuation for students studying EDST6725, reflecting on their classroom and content knowledge in Mathematics. Students will also critique themselves and their peers understanding of teaching Mathematics.

THE MAIN WAYS IN WHICH THE COURSE HAS CHANGED AS A RESULT OF STUDENT FEEDBACK:

- Continued teaching practice opportunities by preservice teachers as well as other tutorial activities.

STUDENT LEARNING OUTCOMES

Outcome	
1	Identify essential elements of the NESA Mathematics Syllabus, and strategies to support students as they transition between stages
2	Use strong knowledge of subject content to plan and evaluate coherent, goal-oriented and challenging lessons, lesson sequences and teaching programs which will engage all students
3	Set achievable learning outcomes to match content, teaching strategies, resources and different types of assessment for a unit of work in Mathematics
4	Provide clear directions to organise and support prepared activities and use resources
5	Assess and report on student learning in Mathematics to all key stakeholders
6	Identify the characteristics of an effective Mathematics teacher and the standards of professional practice in teaching, especially the attributes of Graduate teachers

AUSTRALIAN PROFESSIONAL STANDARDS FOR TEACHERS

Standard	
1.1.1	Demonstrate knowledge and understanding of physical, social and intellectual development and characteristics of students and how these may affect learning
1.2.1	Demonstrate knowledge and understanding of research into how students learn and the implications for teaching
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
1.5.1	Demonstrate knowledge and understanding of strategies for differentiating teaching to meet the specific learning needs of students across the full range of abilities
2.1.1	Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area
2.2.1	Organise content into an effective learning and teaching sequence
2.3.1	Use curriculum, assessment and reporting knowledge to design learning sequences and lesson plans
2.5.1	Know and understand literacy and numeracy teaching strategies and their application in teaching areas
2.6.1	Implement teaching strategies for using ICT to expand curriculum learning opportunities for students
3.1.1	Set learning goals that provide achievable challenges for students of varying characteristics
3.2.1	Plan lesson sequences using knowledge of student learning, content and effective teaching strategies
3.3.1	Include a range of teaching strategies
3.4.1	Demonstrate knowledge of a range of resources including ICT that engage students in their learning
3.6.1	Demonstrate broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning
4.2.1	Demonstrate the capacity to organise classroom activities and provide clear directions
5.1.1	Demonstrate understanding of assessment strategies, including informal and formal, diagnostic, formative and summative approaches to assess student learning
5.2.1	Provide feedback to students on their learning
5.3.1	Make consistent and comparable judgements
5.4.1	Demonstrate the capacity to interpret student assessment data to evaluate student learning and modify teaching practice
5.5.1	Report on student achievement

6.3.1	Seek and apply constructive feedback from supervisors and teachers to improve teaching practices.
7.1.1	Understand and apply the key principles described in codes of ethics and conduct for the teaching profession

NATIONAL PRIORITY AREA ELABORATIONS

Priority area	
A. Aboriginal and Torres Strait Islander Education	5, 8
B. Classroom Management	
C. Information and Communication Technologies	4, 5, 8, 12
D. Literacy and Numeracy	1, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
E. Students with Special Educational Needs	6, 7
F. Teaching Students from Non-English-Speaking Backgrounds	2, 6, 9

4. RATIONALE FOR THE INCLUSION OF CONTENT AND TEACHING APPROACH

Student-centred activities will form the basis of the course. These activities will draw on the prior knowledge of the students and will allow them to engage in relevant and challenging experiences that mirror those they will be expected to design for the secondary students they will later teach. The lectures and tutorials are designed to be supportive and friendly, as we believe that students are more engaged and learn better when given challenging tasks, thinking time and good feedback.

5. TEACHING STRATEGIES

Teaching strategies used during the course will include:

- Small group cooperative learning, such as Jigsaw, to understand the importance of teamwork in an educational context and to demonstrate the use of group structures as appropriate to address teaching and learning goals
- Explicit teaching, including lectures, to demonstrate an understanding of students' different approaches to learning and the use of a range of teaching strategies to foster interest and support learning
- Structured occasions for reflection on learning, such as the use of learning journals, to allow students to reflect critically on and improve teaching practice and strategies
- Extensive opportunities for whole group and small group dialogue and discussion, allowing students the opportunity to demonstrate their capacity to communicate and liaise with the diverse members of an education community, and to demonstrate their knowledge and understanding of method content.
- Online learning from readings on the Moodle website
- Specific numeracy and problem-solving strategies.

These activities will occur in a supportive environment which is inclusive of all learners.

6. COURSE CONTENT AND STRUCTURE

Module	Topics	Tutorials
1 (24 hours eq. lecture/ tutorial time)	***On-line assessment module*** • Introduction to the concept and principles of effective assessment practices and their applications to learning and teaching • Focus is on building assessment knowledge and the skills required to plan, develop and implement a range of assessment strategies, to engage in moderation activities to ensure fair and consistent judgment of student learning, to analyse assessment data to inform future learning and teaching, and to develop reports for various stakeholders.	• Critically describe the role of assessment in ensuring effective learning and teaching; • Evaluate the appropriateness of various assessment strategies in ensuring effective learning and teaching • Apply assessment knowledge and skills in developing effective learning, teaching and assessment plans. Content of this module will be assessed during the Hurdle Requirement in Week 6
2	Discussion of the course outline & assessment 1 Why Teach Mathematics? Teaching for Understanding: common misconceptions	Dan Meyer: Three Act Lessons *Oral Presentations*
3	Alternate Problem-Solving Methods. Solving one problem in different ways. How can this strategy address National Priority Areas?	Teaching Ratios *Oral Presentations*
4	Mathematics Advanced Course Trigonometry Asking good questions	Year 11 topics, advice on HSC exam techniques, and common mistakes. *Oral Presentations*
5	Literacy and Numeracy Demands Working Mathematically	Educational Philosophy Preparing and applying for a job *Oral Presentations*
6	Ext 1 Mathematics Course Identifying areas of concern for students	**Hurdle Requirement as class activity:** Assessment and learning. Self and peer assessment. Moderation. Feedback. On-line course evaluation
7	Mathematics Standard Course Using ICT, Syllabus requirements	Curriculum, Reference sheet, Finance and Two-way Tables *Oral Presentations*

7. RESOURCES

Required readings

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

All students must buy copies of the following Mathematics syllabuses:

- *Mathematics 7-10 Syllabus*,
- *(New) Stage 6 Syllabus, Mathematics Advanced, Extension 1 and 2,*

Alternatively, it is possible to download these syllabuses from the NESA website

http://educationstandards.nsw.edu.au/wps/portal/nesa/11-12/stage-6-learning-areas/stage-6-mathematics

Further readings

Readings on UNSW Moodle

Ernest, P. (1998). *Social constructivism as a philosophy of mathematics*: State University of New York Press.

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.

Hargreaves, E. (2005). Assessment for learning? Thinking outside the (black) box. *Cambridge Journal of Education, 35*(2), 213-224. doi: 10.1080/03057640500146880

Harrison, N. (2008). *Teaching and learning in Indigenous education.* Oxford, Sydney.

Henderson, R. (2012). *Teaching Literacies. Pedagogies and Diversity in the Middle Years*, Oxford University Press, Australia

Hiebert, J., & Lefevre, P. (1986). Conceptual and procedural knowledge in mathematics: An introductory analysis. In J. Hiebert (Ed.), *Conceptual and procedural knowledge: The case of mathematics.* (pp. 1-27): Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.

Hyde, M., Carpenter, L. & Conway, R. (2010). *Diversity and Inclusion in Australian Schools*. Oxford University Press, Australia

Killen, R. (2005). *Programming and assessment for quality teaching and learning*: Thomson/Social Science Press.

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.

Schoenfeld, A. H. (2004). The math wars. *Educational Policy, 18*(1), 253-253-286.

Skemp, R. R. (2006). Relational understanding and instrumental understanding. *Mathematics Teaching in the Middle School, 12*(2), 88-88-95.

Sullivan, P. (2011). Teaching mathematics: using research informed strategies. Melbourne: ACER Pres

Recommended Texts:

Watson, A., Jones, K., & Pratt, D. (2013). *Key Ideas in Teaching Mathematics: Research-based guidance for ages 9-19*. OUP Oxford.

Professional websites for Mathematics teachers:

www.mansw.nsw.edu.au

www.aamt.com.au

http://www.nesa.nsw.edu.au

http://educationstandards.nsw.edu.au/wps/portal/nesa/11-12/stage-6-learning-areas/stage-6-mathematics

http://www.det.nsw.edu.au - The Department of Education and Training.
The DET has the responsibility for administering and staffing government schools and producing support material which can be found at:
http://www.curriculumsupport.education.nsw.gov.au/secondary/mathematics/index

www.studentnet.edu.au/aispd/index.html - The Association of Independent Schools

www.cecnsw.catholic.edu.au - The Catholic Education Commission

www.curriculum.edu.au - A part of the Curriculum Corporation of Victoria website.
This is a tutorial which is useful if you are uncertain of how to use the internet and/or want ideas for using the internet in the classroom, teaching students how to explore English sites etc. Well worth a browse.

http://www.nswteachers.nsw.edu.au - The teaching standards detailed on the NSW Institute of Teachers website

http://www.naplan.edu.au/ - The National Assessment Program Literacy and Numeracy website

http://www.acara.edu.au/ - The Australian Curriculum, Assessment and Reporting Authority

8. ASSESSMENT

Assessment Task	Length	Weight	Student Learning Outcomes Assessed	Program Learning Outcomes Assessed	National Priority Area Elaborations Assessed	Due Date
Assessment 1 Scope and sequence and one assessment task for a year: Mathematics Advanced Course	2000 words equivalent	40%	1-5	1.3.1, 1.5.1, 2.1.1, 2.2.1, 2.3.1, 2.5.1, 3.2.1, 5.3.1, 6.3.1	D.1, 4, 5, 7, 8, 11,19 E.7 F.9	Monday August 2nd by 5pm
Assessment 2 Unit of work: HSC Mathematics Standard Course	3000 words equivalent	60%	1-5	1.3.1, 1.5.1, 2.1.1, 2.2.1, 2.3.1, 2.5.1, 2.6.1, 3.2.1, 5.1.1, 5.4.1	A.5. 8 C.4, 5, 8, 12 D.4, 5, 8. 10, 11, 12, 15 E.2 F.5, 7, 9	Friday August 27th by 5pm
Hurdle requirement Assessment, Feedback and Reporting	In class Week 6	Hurdle requirement	5-6	5.1.1, 5.2.1, 5.3.1, 5.4.1, 5.5.1, 7.1.1	D.9, 13, 14, 16 E.6	In class task in week 6 tutorial

Submission of assessments

Students are required to follow their lecturer's instructions when submitting their work for assessment. All assessments will be submitted online via Moodle by 5pm on the date specified above. Students are also required to keep all drafts, original data and other evidence of the authenticity of the work for at least one year after examination. If an assessment is mislaid the student is responsible for providing a further copy. Please see the Student Policies and Procedures for information regarding submission, extensions, special consideration, late penalties and hurdle requirements etc.
https://education.arts.unsw.edu.au/students/courses/course-outlines/

Assessment Details

Assessment 1 (2000 wd eq, 40%)

PART 1: Create a scope and sequence, including learning outcomes, for a Year 11 Preliminary class (three terms).

PART 2: Prepare an assessment task (not an essay) that directly links to the teaching and learning intentions within **one** of the terms. Your scope and sequence must indicate when the task will occur.

Make sure your instructions for the task are grammatically correct and communicate effectively for students.

Design a marking rubric, which also includes space for a holistic comment.

Provide an exemplar student answer for the assessment task. Write a feedback comment for this response outlining its strengths and indicating at least one aspect which could be further improved.

Provide solutions for the assessment task.

Assessment 2 (3000 wd eq, 60%)

Prepare a unit of work for the Year 12 Mathematics Standard Course which covers approximately half the term. You need to ensure the unit demonstrates you are ready to plan and teach Stage 6 effectively. Make sure you have reflected on the feedback you received for the scope and sequence you prepared for Assessment 1.

The unit of work should indicate a variety of formative assessment strategies which will provide students with feedback about:

a. what they can already do well

b. what they still need to improve

c. how they can effectively close the gap between a and b.

Include all activities and resources to support student learning. There must be at least one literacy activity/resource and one numeracy/ICT resource.

HURDLE REQUIREMENT

FEEDBACK AND REPORTING

Assessment is the process of gathering evidence from a variety of sources about learning outcomes and being able to use that information to improve learning and teaching. Evidence includes not only individual student work samples and test results, but also more global data derived from standardized tests (e.g. NAPLAN, ICAS, HSC etc) as well as more qualitative information generated from student self and peer evaluations, and student-parent conferences.

Feedback is a structured interaction with the student about their current learning: where they are, where they want and /or need to be and how to get there. It may be in oral or written form and may be given by the teacher, by the student's peers or take the form of self-assessment. Feedback needs to indicate learning that has been demonstrated (achieved) as well as what needs more work. For the feedback to also feed forward, comments need to provide students with strategies to guide their improvement. Feedback /reporting to and for parents is also important as they are critical stakeholders and partners in their children's learning.

Moderation is a process used by teachers to compare their judgements about student performance so that assessment is trustworthy. Teachers work together as a group to ensure that the way they use assessment grades is consistent with agreed or published standards. For A to E grades this means the grade a student receives in one school can be fairly compared to the same grade anywhere in NSW. For school-based tasks, it means the work of students in different classes can be assessed using the same success criteria to evaluate progress toward learning outcomes. Watch the series of seven videos to enhance your understanding and knowledge on how to make sound and consistent judgment of student work.
https://www.youtube.com/watch?v=-QBLZAbhaYc&list=PLgBQxWO_rR7ZrlZopD_wZvdt6kY8EsfLK

It is recommended that students read widely on how to design appropriate assessment tasks, how moderate student samples of work and how to provide effective feedback. Tutorial time will be allocated to discussing this aspect of professional competence and providing experience with the moderation and feedback process

The assessment process consists of two components.

1. A collection of five or six authentic student responses to preferably two assessment tasks. The responses may be written, visual or oral. The number depends on the length of the response. For each text

- ensure anonymity by removing student names and destroying the samples at the end of the course.
- include the instructions that were given for the assessment task and indicate whether the task was intended for formative purposes or summative and formative purposes
- annotate the task to indicate what worked well and what needs changing if it were to be used again
- include the assessment criteria and/or marking scheme/rubric for each task
- provide annotations (with time codes if your sample is audio- or video-based) to indicate what the student has demonstrated as areas of strength and areas that need to be developed further in relation to the task
- include a key for marking symbols
- find out what the general expectation and/or current standards of the school/system are in relation to this subject area/topic/skill by consulting published NAPLAN/HSC/other relevant data, as well as talking to teachers, and consider where this student work is in relation to those overall expectations/standards as well in relation to their previous performance

- provide written feedback for the student which indicates strengths and areas for improvement in relation to this work sample as well as their past performance and overall expectations/standards. Suggest a strategy that will guide the student in his/her learning. (If the task was used summatively you can still use it for formative purposes.)
- indicate what the implications of your evaluation might be for the teacher in terms of future teaching.

2. Write a few lines that could be included in a mid-year report comment to parents. Provide enough detail to indicate to parents which aspect of the student's performance you are commenting on. Add A, B, C, D or E to align with the advice and work samples provided by NESA and ACARA.

NOTES:
The student work samples must be authentic. They should have been collected during Professional Experience 1 during a normal assessment task and/or provided by the method lecturer. Annotated student work samples, notes and all other written evidence of teacher education students' ability to address Standard 5 to be discussed in class and submitted by the due date.

If a student is assessed as Unsatisfactory in the feedback and reporting hurdle requirement, s/he will automatically fail Method 2 overall, and not be permitted to undertake Professional Experience or any further method work in that teaching area until the key concerns have been resolved.

UNSW SCHOOL OF EDUCATION
FEEDBACK SHEET
EDST6755 MATHEMATICS METHOD 2

Student Name: Student Number:

Assessment Task 1: **Scope and sequence with assessment task for Prelim year (Advanced Course)**

SPECIFIC CRITERIA	(-) ⟶ (+)				
Understanding of the question or issue and the key concepts involved • Understands the task and its relationship to relevant areas of theory, research and practice • Uses syllabus documents and terminology clearly and accurately • Sequences tasks and activities to suit logical learning progression • Integrates assessment task logically with learning intentions and learning sequence • Provides effective formative feedback for student sample					
Depth of analysis in response to the task • Includes key syllabus content to allow demonstration of appropriate selection of outcomes for Preliminary • Demonstrates understanding of the NSW Quality Teaching framework, the School Excellence Framework and NESA Assessment Guidelines					
Familiarity with and relevance of professional and/or research literature used to support response • Demonstrates understanding of the need to differentiate lessons to cater for diverse learners including Aboriginal and Torres Strait Islander and EAL/D students • Understands effective assessment practices					
Structure and organisation or response • Organises and structures scope and sequence according to NESA guidelines and requirements • Follows NESA assessment guidelines					
Presentation of response according to appropriate academic and linguistic conventions • Shows excellent command of English grammar conventions including spelling, syntax, and punctuation.					
GENERAL COMMENTS/RECOMMENDATIONS FOR NEXT TIME					

Lecturer: **Date:**

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 contextualize 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**

UNSW SCHOOL OF EDUCATION
FEEDBACK SHEET
EDST6755 MATHEMATICS METHOD 2

Student Name: Student Number:

Assessment Task 2: **Planning a unit of work including formative assessment strategies (Standard Course)**

SPECIFIC CRITERIA	(-) ⟶ (+)				
Understanding of the question or issue and the key concepts involved • Demonstrates knowledge of selected Stage 6 course and syllabus outcomes • Sequences tasks and activities to suit logical learning progression and meet selected outcomes for Year 12 • Integrates formative assessment strategies throughout the unit of work					
Depth of evidence in response to the task • Demonstrates understanding of academic and cultural diversity • Includes a variety of pedagogical strategies to suit content of the Stage 6 course • Designs appropriate activities and outlines lessons in sufficient detail without providing full plans • Provides effective feedback opportunities to inform students of their progress					
Familiarity with and relevance of professional and/or research literature used to support response • Demonstrates understanding of the need to differentiate lessons to cater for diverse learners • Understanding of a range of effective assessment practices					
Structure and organisation or response • Demonstrates ability to plan using backward mapping to meet selected outcomes • Presentation of effective and engaging learning sequence					
Presentation of response according to appropriate academic and linguistic conventions • Writes using correct Standard Australian English • Has proofread and edited work to avoid typos and incorrect usage.					
GENERAL COMMENTS/RECOMMENDATIONS FOR NEXT TIME					

Lecturer: **Date:**

Recommended: /20 (FL PS CR DN HD) **Weighting: 60%**

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 contextualize 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**

Assessment, Feedback and Reporting

UNSW SYDNEY

STUDENT TEACHER		
Name:	zID:	Date:

Details			
Method		Topic/level	

AITSL Standard 5 Assess, provide feedback and report on student learning	Comments
A. Demonstrate understanding of assessment strategies, including informal and formal, diagnostic, formative and summative approaches to assess student learning (5.1.1) • Has the purpose of the assessment task been described appropriately? • Has the task been annotated appropriately to indicate what changes in layout, language or requirement could be improved? • Does the marking rubric/style provide diagnostic information for the student?	
B. Demonstrate an understanding of the purpose of providing timely and appropriate feedback to students about their learning (5.2.1) • Does the feedback allow the assessment to be used for formative purposes? • Is feedback expressed in appropriate language for the age/stage of the students? • Does the feedback -acknowledge the student's areas of strength? -identify areas where the student needs to do more work? -indicate strategies to help the student improve?	
C. Demonstrate understanding of assessment moderation and its application to support consistent and comparable judgements of student learning (5.3.1) • Is the difference between ranking and moderation understood? • Does the student recognise the importance of following marking guides/rubrics? • Can the student listen professionally to the opinions of others? • Does the student express his/her point of view respectfully, and provide appropriate evidence to support his viewpoint?	
D. Demonstrate the capacity to interpret student assessment data to evaluate student learning and modify teaching practice (5.4.1) • Has the student analysed and evaluated the schools' global assessment data? • Has the student collected a range of the students' past performance data? • Is the student able to interpret that data accurately to make generalizations about the specific work samples they have collected? • Is the student able to triangulate different forms of student assessment data so that they can propose appropriate modifications to learning and teaching?	
E. Demonstrate understanding of a range of strategies for reporting to students and parents/caregivers and the purpose of keeping accurate and reliable records of student achievement (5.5.1) • Are feedback and reporting understood as separate tasks? • Do the report comments provide succinct and helpful written information to pinpoint where the student is at in his/her learning? • Has the student provided evidence that the Assessment Resource Centre (NESA) has been used to provide appropriate A, B, C, D, E grades?	
Comments:	

Lecturer: **Date:** **Satisfactory / Unsatisfactory (circle)**