## Contents

1. LOCATION ..................................................................................................................... 2  
2. STAFF CONTACT DETAILS .......................................................................................... 2  
3. COURSE DETAILS ........................................................................................................ 2  
   - Aims of the Course ........................................................................................................ 2  
   - Student Learning Outcomes ....................................................................................... 3  
   - Graduate Attributes (AITSL Professional Graduate Teaching Standards) ............. 3  
   - National Priority Area Elaborations ............................................................................ 3  
4. RATIONALE FOR THE INCLUSION OF CONTENT AND TEACHING APPROACH ...... 4  
5. TEACHING STRATEGIES ............................................................................................. 4  
6. COURSE CONTENT AND STRUCTURE ...................................................................... 5  
7. ASSESSMENT .............................................................................................................. 7  
   - Assessment Details ..................................................................................................... 7  
   - Submission of Assessment Tasks ................................................................................ 10  
8. RESOURCES .............................................................................................................. 10  
   - Required Readings .................................................................................................... 10  

**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/](https://education.arts.unsw.edu.au/students/courses/course-outlines/)

The School of Education acknowledges the Bidjigal and Gadigal people as the traditional custodians of the lands upon which we learn and teach.
1. LOCATION

Faculty of Arts and Social Sciences
School of Education
EDST6726 Extension Mathematics Method 1 (6 units of credit)
Semester 1 2015

2. STAFF CONTACT DETAILS

Course Coordinator: Yvette Semler
Office Location: John Goodsell 132
Email: y.semler@unsw.edu.au
Phone: 0414 973 018
Availability: Thursday 7-7.30 pm or via email

3. COURSE DETAILS

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Extension Mathematics Method 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit Points</td>
<td>6 units of credit (uoc)</td>
</tr>
<tr>
<td>Workload</td>
<td>Includes 150 hours including class contact hours, readings, class preparation, assessment, follow up activities, etc.</td>
</tr>
</tbody>
</table>

**Schedule**

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Thursday 16:00 – 17:00, John Goodsell 119</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutorials</td>
<td>Thursday 17:00 – 19:00, John Goodsell 119</td>
</tr>
<tr>
<td>Week</td>
<td>Weeks 1-5, 6-10, 11</td>
</tr>
<tr>
<td>Week</td>
<td>Weeks 1-5, 6-10, 11</td>
</tr>
</tbody>
</table>

**Summary of Course**

This course is designed as an extension Mathematics method course focusing on a deep understanding of pedagogical content knowledge for Mathematics teaching. Students will critically examine syllabuses. Students will appraise a range of strategies for teaching and assessing Mathematics and consider elements needed for quality teaching specific to Mathematics. Students enrolling in this course must also complete EDST6725 – Mathematics Method 1 (6uoc).

**Aims of the Course**

This course aims to:

- Increase a student’s pedagogical content knowledge for Mathematics teaching.
- Develop a student’s understanding of what comprises effective classroom practice.

**Important information**

- **Assessment**: Please note that all students must pass all assignments to pass the course, and they must pass the course to go on placement for PE 1.
- **Attendance**: Students are expected to give priority to university study commitments. Unless specific and formal permission has been granted, attendance at less than 80% of classes in a course may result in failure.
## Student Learning Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Assessment/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Demonstrate knowledge and understanding of the NSW Board of Studies Mathematics Syllabuses for stages 4/5 and stage 6 and extension Mathematics.</td>
</tr>
<tr>
<td>3</td>
<td>Demonstrate the essential link between outcomes, assessment, teaching strategies and lesson planning.</td>
</tr>
<tr>
<td>7</td>
<td>Discuss classroom strategies that recognize students’ different approaches to learning.</td>
</tr>
<tr>
<td>8</td>
<td>Analyse specific assessment strategies for a diverse range of students</td>
</tr>
<tr>
<td>9</td>
<td>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.</td>
</tr>
</tbody>
</table>

## Graduate Attributes (AITSL Professional Graduate Teaching Standards)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Assessment/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>Demonstrate knowledge and understanding of research into how students learn and the implications for teaching.</td>
</tr>
<tr>
<td>1.3</td>
<td>Demonstrate knowledge of teaching strategies that are responsive to the learning strengths and needs of students from diverse linguistics, cultural, religious and socioeconomic backgrounds.</td>
</tr>
<tr>
<td>2.1</td>
<td>Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area.</td>
</tr>
<tr>
<td>2.4</td>
<td>Demonstrate broad knowledge of, understanding of and respect for Aboriginal and Torres strait Islander histories, cultures and languages</td>
</tr>
<tr>
<td>2.5</td>
<td>Know and understand literacy and numeracy teaching strategies and their application in teaching areas</td>
</tr>
<tr>
<td>2.6</td>
<td>Implement teaching strategies for using ICT to expand curriculum learning opportunities for students</td>
</tr>
<tr>
<td>3.3</td>
<td>Include a range of teaching strategies.</td>
</tr>
<tr>
<td>3.4</td>
<td>Demonstrate knowledge of a range of resources including ICT that engage students in their learning.</td>
</tr>
</tbody>
</table>

## National Priority Area Elaborations

<table>
<thead>
<tr>
<th>Priority area</th>
<th>Assessment/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal and Torres Strait Islander Education</td>
<td>A1-9, Week 2</td>
</tr>
<tr>
<td>Classroom Management</td>
<td>B 1-5 Week 5</td>
</tr>
<tr>
<td>Information and Communication Technologies</td>
<td>C 1-6 Week 4</td>
</tr>
<tr>
<td>Literacy and Numeracy</td>
<td>D 1-19 Across all Weeks and Assignments</td>
</tr>
<tr>
<td>Students with Special Educational Needs</td>
<td>E 1-4 Week 6</td>
</tr>
</tbody>
</table>
4. RATIONALE FOR THE INCLUSION OF CONTENT AND TEACHING APPROACH

This subject aims to develop best practice in teaching based on current research. During the course students will expand their knowledge of New South Wales and The Australian Curriculum syllabus documents. Lectures, tutorials and assignments will cover a variety of approaches to teaching and learning in the Mathematics classroom. Emphasis will be given to the relationship between Mathematics, literacy and numeracy and the role and value of Mathematics in the curriculum and the community.

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.

5. TEACHING STRATEGIES

- 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.
- Small group cooperative learning 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.
- 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.
- Structured occasions for reflection on learning to allow students to reflect critically on and improve teaching practice.
- Online learning from readings on the Moodle website.
- Online discussions.
- Peer teaching in a simulated classroom setting.

These activities will occur in a classroom climate that is supportive and inclusive of all learners.
### 6. COURSE CONTENT AND STRUCTURE

<table>
<thead>
<tr>
<th>Week Beginning</th>
<th>Weekly Topic</th>
</tr>
</thead>
</table>
| 1 (2-6 March)  | Introduction to the BOS syllabus stages 4-5, 6  
|                | Problem Solving & Investigations  
|                | Working Mathematically |
| 2 (9-13 March) | Number Strand – Directed Numbers  
|                | Questioning Techniques  
|                | Meeting the needs of Aboriginal and Torres Strait Islander Education  
|                | Student Presentations  
|                | **Priority Areas**  
|                | Indigenous A1-9  
|                | Teaching Students from NESB F3, 4 |
| 3 (16-20 March)| Introducing Lessons Ideas for Teaching Algebra  
|                | Writing Assessments  
|                | Student Presentations |
| 4 (23-27 March)| Teaching with Technology  
|                | **Micro Teaching**  
|                | **Priority Areas**  
|                | ICT C1-6  
|                | *Assignment 1 is due on Moodle 25 March*  
|                | *(Hard copy handed in the following day at 4:15pm)* |
| 5 (30 March-3 April) | Managing the mathematics classroom  
|                | Dealing with challenging behaviours  
|                | Student Engagement  
|                | **Micro Teaching**  
|                | **Class Quiz**  
|                | **Priority Areas**  
|                | Classroom Management B1-5 |
|                | **Mid-Semester Break**  
| 6 (13-17 April)| Teaching gifted and talented students in Mathematics  
|                | **Micro Teaching**  
<p>|                | <strong>Priority Areas</strong> |</p>
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
</table>
| 7 (20-24 Apr) | Calculus  
Micro Teaching  
Class Quiz |
| 8 (27 Apr-1 May) | Analysing Lessons  
Observing Lessons and reflecting on classroom practice. What is best practice?  
Micro Teaching |
| 9 (4-8 May) | Senior Syllabus:  
Planning lessons & units of work  
Micro Teaching  
Class Quiz |
| 10 (11-15 May) | The Mathematics Course HSC  
Micro Teaching  
**Assessment 2 is due on Moodle 13 May**  
(Hard copy handed in the following day at 4:15pm) |
| **Professional Experience** | |
| 11 (22-26 June) | The Extension 1 HSC Course  
*ICT presentations*  
Class Quiz |
7. ASSESSMENT

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Length</th>
<th>Weight</th>
<th>Learning Outcomes Assessed</th>
<th>Graduate Attributes Assessed</th>
<th>National Priority Area Elaborations</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Writing Assessment tasks</td>
<td>2500 words or equivalent</td>
<td>40%</td>
<td>1, 3, 7, 8</td>
<td>1.2, 1.3, 2.1, 3.3, 3.4</td>
<td>A1-9, B1-5, D1-19</td>
<td>Week 4, 25 March</td>
</tr>
<tr>
<td>2. Technology</td>
<td>2500 words or equivalent</td>
<td>40%</td>
<td>1, 8, 9</td>
<td>1.2, 1.3, 2.6, 3.3, 3.4</td>
<td>A1-9, B1-5, C1-6, D1-19</td>
<td>Week 10, 13 May</td>
</tr>
<tr>
<td>3. Microteaching</td>
<td>Based on readings and lectures</td>
<td>0%</td>
<td>1, 3, 7, 9</td>
<td>1.2, 1.3, 2.1, 2.5, 2.6, 3.4, 3.3</td>
<td>B1-5, D1-19</td>
<td>Week 4 – 10</td>
</tr>
<tr>
<td>4. Class Quizzes</td>
<td>Based on readings and lectures</td>
<td>20%</td>
<td>1, 3, 7, 8, 9</td>
<td>1.2, 1.3, 2.1, 2.5, 3.3</td>
<td>A1-9, C1-6, D1-19</td>
<td>Week 5, 7, 9, 11</td>
</tr>
</tbody>
</table>

Assessment Details

1. Creating an Assessment Task for a Unit of Work in Mathematics (40%)
Construct a 20-minute assessment task for a unit of work in any of the NSW Mathematics syllabuses using your ICT skills to present it.

- The assessment should be a written task (e.g. it can be an end of unit test or an assessable project).
- Identify all NSW BOS or Australian Curriculum (for NSW) 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.
- Include and justify your marking criteria for this task.
- Word counts for such assessments may vary greatly. If you are unsure about this aspect, please email me for further clarification.
- The assessment task must be handed in to the lecturer in person on the due date.

2. The use of technology in teaching mathematical concepts (40%)
Explain how you would use a computer-based mathematical tool (e.g. Geogebra, Autograph, MSExcel, Wolfram Alpha, Geometer’s Sketchpad etc.) to help students learn a particular mathematical concept.

- Identify a mathematical concept that you wish to teach using technology as an aide.
- Identify all NSW BOS or Australian Curriculum (for NSW) outcomes in the task and show how they are linked to the activity.
- Include a worksheet for students to use for this activity using your ICT skills.
- 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 assessment for learning (AfL) in the process. Once again, avoid giving your own opinion without any backing from research literature.
- The assessment task must be handed in to the lecturer in person on the due date.
UNSW SCHOOL OF EDUCATION

FEEDBACK SHEET - EDST6726 EXTENSION MATHEMATICS METHOD 1

Student Name:              Student No.:
Assessment Task 1

<table>
<thead>
<tr>
<th>Specific criteria</th>
<th>(-)</th>
<th>(+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding of the question or issue and the key concepts involved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Understanding of the task and its relationship to relevant areas of theory, research and practice.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Rationale linked to outcomes in the syllabus.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Show evidence of critical analysis and reflection.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth of analysis and/or critique in response to the task</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ability to plan and assess for effective learning by designing a detailed lesson on a suitable proforma, using knowledge of the NSW syllabus documents or other curriculum requirements of the education act.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Reasons for the choice of teaching and learning strategies effectively explained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Demonstration of knowledge, respect and understanding of the social, ethnic, cultural and religious backgrounds of students and how these factors may affect learning.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Demonstrates knowledge of resources that will engage and extend all students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Clear statement of syllabus outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Lesson/Task goal(s) clearly linked to syllabus outcomes and chosen strategies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Familiarity with and relevance of professional and/or research literature used to support response</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 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.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structure and organisation of response</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentation of response according to appropriate academic and linguistic conventions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General comments/recommendations for next time</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 - EDST6726 EXTENSION MATHEMATICS METHOD 1

Student Name:              Student No.:
Assessment Task 2

Specific criteria

Understanding of the question or issue and the key concepts involved
- Understanding of the task and its relationship to relevant areas of theory, research and practice.
- Rationale linked to outcomes in the syllabus.
- Show evidence of critical analysis and reflection.

Depth of analysis and/or critique in response to the task
- Ability to plan and assess for effective learning by designing a detailed lesson on a suitable proforma, using knowledge of the NSW syllabus documents or other curriculum requirements of the education act.
- Reasons for the choice of teaching and learning strategies effectively explained
- Demonstration of knowledge, respect and understanding of the social, ethnic, cultural and religious backgrounds of students and how these factors may affect learning.
- Demonstrates knowledge of resources that will engage and extend all students.
- Clear statement of syllabus outcomes
- Lesson/Task goal(s) clearly linked to syllabus outcomes and chosen strategies

Familiarity with and relevance of professional and/or research literature used to support response
- 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.

Structure and organisation of response

Presentation of response according to appropriate academic and linguistic conventions

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.
Assessment 3 see EDST 6725 outline for microteaching details

Assessment 4 consists of short answer quizzes over the weeks 5, 7, 9, 11 and will be based on lectures and readings as per the outline and on moodle.

Submission of Assessment Tasks
Students are required to follow their lecturer’s instructions when submitting their work for assessment. Some work may be required to be submitted in class but most assessments are to be delivered to the locked boxes near the School of Education office and submitted online via Moodle. 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.

A penalty of 3% per day (24 hours) applies to work submitted after the due date without an approved extension. Extension forms are available from the School of Education office and must be approved by the appropriate course coordinator prior to the due date. Extensions will only be granted for illness or serious problems beyond a student’s control. Please note that the submission of a request for an extension does not necessarily guarantee approval of the request. Requests for extensions on the grounds of illness must be supported by a medical certificate or other documentation. This process does not take the place of lodging an application for Special Consideration and students must consider the merits of both options available. Please note that computer malfunctions will not be considered as sufficient grounds for extension.

8. RESOURCES
Required Texts


NSW Board of Studies Stage 4, 5 & 6 Syllabuses
Australian Curriculum Documents for NSW Stage 4 and Stage 5

Required Readings

- Attwood, B. (2005), Telling the truth about Aboriginal history. All and Unwin, Crows Nest.
- Boaler, J. (2010). The Elephant in the Classroom: How to teach kids learn and love mathematics
- 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


• Price, K (2012), *Aboriginal and Torres Strait Islander Education: An Introduction for the Teaching Profession*. Cambridge University Press


**Recommended Websites**

Students can download syllabuses from the Board of Studies website


www.det.nsw.edu.au

www.curriculumsupport.education.nsw.gov.au

www.hsc.csu.edu.au

www.ccecnsw.catholic.edu.au

www.curriculum.edu.au

www.curriculumsupport.education.nsw.gov.au


www.nswteachers.nsw.edu.au

www.mansw.nsw.edu.au

www.aamt.com.au

www.hsc.csu.edu.au

www.tes.co.uk/teaching-resources

www.desmos.com

www.merga.net.au

www.geogebra.org

www.scootle.edu.au

mathslinks.net