



**UNSW**  
AUSTRALIA

Arts & Social  
Sciences

School of Education

EDST6713  
Science Double Method 1

Semester 1, 2017

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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 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  
EDST6713 Science Double Method 1 (12 units of credit)  
Semester 1, 2017

## 2. STAFF CONTACT DETAILS

Course Coordinator: Judith Morgan  
Email: [ja.morgan@unsw.edu.au](mailto:ja.morgan@unsw.edu.au)  
Availability: Monday 7.00 – 7.15 pm

Tutor: Rana Kaddour  
Email: [r.kaddour@unsw.edu.au](mailto:r.kaddour@unsw.edu.au)  
Availability: Thursday 7.30 – 7.45 pm

Tutor: Jennifer Ming  
Email: [j.ming@unsw.edu.au](mailto:j.ming@unsw.edu.au)  
Availability: Thursday 7.300 – 7.45 pm

Tutor: Oriano Miano  
Email: [o.miano@unsw.edu.au](mailto:o.miano@unsw.edu.au)  
Availability: Monday 7.00 – 7.15 pm

## 3. COURSE DETAILS

<b>Course Name</b>	Science Double Method 1
<b>Credit Points</b>	12 units of credit (uoc)
<b>Workload</b>	Includes 300 hours including class contact hours, readings, class preparation, assessment, follow up activities, etc.
<b>Schedule</b>	
Lectures	Mon 16:00-17:30 CLB 5, Thu 16:30-17:30 Chem Sci M10 (w1-10, N4)
Tutorials	Mon 17:30-19:00 Mathews 311, Thu 17:30-19:30 AGSM LG06 (w1-10, N4) Mon 17:30-19:00 Mathews 228, Thu 17:30-19:30 Ainsworth G01 (w1-10, N4)

### *Summary of Course*

This teacher education course is designed to develop appropriate pedagogies for teaching Science, as well as offering an insight into the nature and practice of Science. Preservice teachers will develop skills in planning and teaching lessons, contextualising science, managing practical work in science classrooms and integrating ICT resources into lessons. Important issues such as student prior learning, assessment, student differences and safety are also considered. Preservice teachers will critically evaluate the features of effective classroom practice. The course focuses on the requirements and philosophy of the NSW Science syllabuses.

### *Important Information*

As students already have or will soon have a Science degree, it is assumed that students have a well-developed knowledge of the Science content covered in NSW schools up to the end of stage 5, as well as knowledge of the Science content for at least one Stage 6 course. Science content will not be taught in this course.

This course relies heavily on the use of Moodle, so students will be required to bring a laptop to tutorials, or to negotiate to share one with group members. Students will be allocated to groups in Moodle and will be expected to use the Internet to source a range of materials for lesson and unit planning. Students will use ICT tools to collaborate in groups to design teaching resources that will be uploaded to Moodle for sharing with the whole group, so that by the end of the course students will have access to a wide range of teacher developed resources.

Students are required to upload their photo to their Moodle profile.

### ***The main ways in which the course has changed since last time as a result of student feedback:***

- The structure of the course has changed so that Stage 4/5 and Stage 6 are taught sequentially, reducing overlap
- Microteaching will be conducted throughout the semester, rather than in a block
- Microteaching will consist of a twenty-minute demonstration of a scientific principle
- Nanoteaching has been removed from the course
- Assessment Task 1 has been changed to the production of resources to teach the Nature and Practice of science

### *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*

Outcome		Assessment/s
1	Identify foundational aspects and structure of the NSW Board of Studies Science Syllabus and the depth of subject knowledge required to implement the syllabus	1, 2, 3, 4, 5
2	Evaluate how student characteristics affect learning and evaluate implications for teaching students with different characteristics and from diverse backgrounds	1, 2, 3, 4, 5
3	Use a range of strategies to plan and teach effective lessons to engage all students, address relevant syllabus outcomes and ensure a safe learning environment	1, 2, 3, 4,5
4	Plan teaching strategies which effectively communicate the Nature and practice of Science, the role and value of science in society and the History of Science, and how these strategies contribute to pedagogical content knowledge	1, 2, 3, 4, 5
5	Design and evaluate formative assessment strategies and use assessment information to improve learning	1, 2, 3, 4, 5
6	Select appropriate resources, including ICT, to engage students and expand learning opportunities	2, 3, 4, 5
7	Describe strategies that support students' wellbeing and safety in the Science setting, and curriculum and legislative requirements related to safety in Science.	3, 4, 5
8	Practise the ethical and professional values expected of teachers	1, 2, 3, 4, 5

*Program Learning Outcomes (AITSL Professional Graduate Teaching Standards)*

Standard		Assessment/s
1.2	Demonstrate knowledge and understanding of research into how students learn and the implications for teaching.	1, 2, 3, 4, 5
1.3	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, 3, 4, 5
2.1	Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area.	1, 2, 3, 4, 5
2.2	Organise content into an effective learning and teaching sequence.	2, 3, 4, 5
2.3	Use curriculum, assessment and reporting knowledge to design learning sequences and lesson plans.	2, 3, 4, 5
2.4	Demonstrate broad knowledge of, understanding of and respect for Aboriginal and Torres strait Islander histories, cultures and languages	2, 4, 5
2.5	Know and understand literacy and numeracy teaching strategies and their application in teaching areas	2, 3, 4, 5
2.6	Implement teaching strategies for using ICT to expand curriculum learning opportunities for students.	2, 3, 4, 5
3.1	Set learning goals that provide achievable challenges for students of varying characteristics.	2, 3, 4, 5
3.2	Plan lesson sequences using knowledge of student learning, content and effective teaching strategies.	2, 3, 4, 5
3.3	Include a range of teaching strategies.	2, 3, 4, 5

3.4	Demonstrate knowledge of a range of resources including ICT that engage students in their learning.	2, 3, 4, 5
3.5	Demonstrate a range of verbal and non-verbal communication strategies to support student engagement.	2, 3, 4, 5
3.6	Demonstrate broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning.	1, 2, 3, 4, 5
4.2	Demonstrate the capacity to organise classroom activities and provide clear directions.	2, 3, 4, 5
4.4	Describe strategies that support students' wellbeing and safety working within school and/or system, curriculum and legislative requirements.	3, 4, 5
6.3	Seek and apply constructive feedback from supervisors and teachers to improve teaching practices.	1, 2, 3, 4, 5

#### *National Priority Area Elaborations*

Priority area		Assessment/s
A. Aboriginal and Torres Strait Islander Education	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	2, 4, 5
B. Classroom Management	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	3
C. Information and Communication Technologies	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14	2, 4, 5
D. Literacy and Numeracy	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19	1, 2, 3, 4, 5
E. Students with Special Educational Needs	1, 2, 3, 4, 5, 6, 7, 8, 9	X
F. Teaching Students from Non-English Speaking Backgrounds	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	X

#### **4. RATIONALE FOR THE INCLUSION OF CONTENT AND TEACHING APPROACH**

Lectures, tutorials and assignments will cover a variety of approaches to teaching and learning in the Science classroom. Emphasis will be placed on the relationship between the nature and practice of Science, the role and value of science in society and science pedagogy. A particular focus will be on strategies that can promote student engagement with Science.

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 to foster 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 develop teamwork in an educational context and to demonstrate the use of group structures to address teaching and learning goals
- Structured occasions for reflection on learning to allow students to reflect critically on and improve teaching practice
- 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 and online discussions
- Microteaching: students will prepare and deliver a twenty-minute demonstration lesson to their peers
- In tutorials, students will work in small groups to develop diverse products such as contexts, sections of units of work, lesson plans, teaching resources, and assessment tasks. Each group will upload and share their work in progress to Moodle by 6.45pm on each tutorial evening. This work will be monitored, and will contribute to the total grade for each student. A debriefing session will be conducted at 6:45 during each tutorial.
- In Weeks 9 & 10, students will be broken up into tutorial subgroups based on their preferred senior subject.

These activities will occur in a classroom climate that is supportive and inclusive of all learners.

## 6. COURSE CONTENT AND STRUCTURE

WEEK	MONDAY 4.00 – 7.00 pm	THURSDAY 4.30 – 7.30 pm
1 27 Feb & 2 Mar	<p><b>Lecture: Morgan</b></p> <ul style="list-style-type: none"> <li>• Introduction to course structure and requirements</li> <li>• Where to find information and resources</li> <li>• Discussion of assigned reading related to               <ul style="list-style-type: none"> <li>- Why do Science?</li> <li>- The nature of Science</li> <li>- What is Science Literacy?</li> <li>-The role of the Nature and Practice of Science in Science teaching</li> </ul> </li> </ul> <p><b>Tutorial: Morgan, Miano</b> What should be the nature of Science teaching in contemporary schools?</p> <p><b>Literacy and Numeracy</b> D1, 2, 3</p>	<p><b>Lecture: Ming</b></p> <ul style="list-style-type: none"> <li>• Discussion of assigned reading related to               <ul style="list-style-type: none"> <li>-The role of the History of Science in Science teaching</li> <li>- Developing contexts – making Science relevant</li> </ul> </li> </ul> <p><b>Tutorial: Ming, Kaddour</b> Developing contexts to incorporate the Nature of Science, the History of Science and the Working Scientifically skills</p> <p><b>ICT</b> C1,2,3,4,5,6,7,8,9,10,12,14</p> <p><b>Literacy and Numeracy</b> D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19</p>

2 6 Mar & 9 Mar	<p><b>Lecture: Morgan</b></p> <ul style="list-style-type: none"> <li>Deconstructing the Stage 4/5 Syllabus: structure &amp; requirements</li> </ul> <p><b>Tutorial: Morgan, Miano</b> Analysing the syllabus and associated documents</p> <p><b>ICT</b> C1,2,3,4,5,6,7,8,9,10,12,14</p> <p><b>Literacy and Numeracy</b> D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19</p>	<p><b>Lecture: Ming</b></p> <ul style="list-style-type: none"> <li>Teaching strategies for Science</li> </ul> <p><b>Tutorial: Ming, Kaddour</b> Developing a repertoire of teaching strategies for Science teaching; catering for diverse learners</p> <p><b>Classroom Management</b> B1, 5, 7, 10</p> <p><b>ICT</b> C1,2,3,4,5,6,7,8,9,10,12,14</p> <p><b>Literacy and Numeracy</b> D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19</p>
3 13 Mar & 16 Mar	<p><b>Lecture: Morgan</b></p> <ul style="list-style-type: none"> <li>Incorporating ICT into Science lessons</li> </ul> <p><b>Microteaching</b></p> <p><b>Tutorial: Morgan, Kaddour</b> Planning Stage 4/5 lessons using ICT</p> <p><b>Literacy and Numeracy</b> D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19</p>	<p><b>Lecture: Ming</b></p> <ul style="list-style-type: none"> <li>Using the syllabus to plan Stage 4/5 lessons</li> </ul> <p><b>Microteaching</b></p> <p><b>Tutorial: Ming, Kaddour</b> Planning Stage 4/5 lessons</p> <p><b>Classroom Management</b> B1, 5, 7, 10</p> <p><b>ICT</b> C1,2,3,4,5,6,7,8,9,10,12,14</p> <p><b>Literacy and Numeracy</b> D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19</p>
4 20 Mar & 23 Mar	<p><b>Lecture: Miano</b></p> <ul style="list-style-type: none"> <li>Practical Work and the Working Scientifically Outcomes, including the incorporation of literacy and numeracy strategies</li> </ul> <p><b>Microteaching</b></p> <p><b>Tutorial: Miano, Kaddour</b> Developing a repertoire of teaching strategies for Science teaching – practical work</p> <p><b>Literacy and Numeracy</b> D1, 2, 3, 5, 6 8</p>	<p><b>Lecture: Kaddour</b></p> <ul style="list-style-type: none"> <li>Safety in the Science Laboratory</li> </ul> <p><b>Microteaching</b></p> <p><b>Tutorial: Ming, Kaddour</b> Developing a repertoire of teaching strategies for Science teaching – practical work</p> <p><b>Literacy and Numeracy</b> D1, 2, 3, 5, 6 8</p>
5 27 Mar & 30 Mar	<p><b>Off-site: Matraville High School</b></p> <p><b>Lecture: Morgan</b></p> <ul style="list-style-type: none"> <li>Orientation to a high school laboratory</li> </ul> <p><b>Microteaching</b></p> <p><b>Tutorial: Morgan, Miano</b> Familiarisation with a high school laboratory</p> <p><b>Literacy and Numeracy</b> D1, 2, 3, 5, 6 8</p>	<p><b>Off-site: Matraville High School</b></p> <p><b>Lecture: Ming</b></p> <ul style="list-style-type: none"> <li>Modelling of one practical Science Stage 4/5 lesson by each tutor</li> </ul> <p><b>Microteaching</b></p> <p><b>Tutorial: Ming, Kaddour</b> Conducting practical work in a high school laboratory</p> <p><b>Literacy and Numeracy</b> D1, 2, 3, 5, 6 8</p>
6 3 Apr & 6 Apr	<p><b>Off-site: Matraville High School</b></p> <p><b>Lecture: Morgan</b></p> <ul style="list-style-type: none"> <li>Strategies for managing practical work</li> </ul> <p><b>Microteaching</b></p> <p><b>Tutorial: Morgan, Miano</b> Conducting practical work in a high school laboratory</p> <p><b>Literacy and Numeracy</b> D1, 2, 3, 5, 6 8</p>	<p><b>Off-site: Matraville High School</b></p> <p><b>Lecture: Ming</b></p> <ul style="list-style-type: none"> <li>Use of data loggers</li> </ul> <p><b>Microteaching</b></p> <p><b>Tutorial: Ming, Kaddour</b> Using data loggers</p> <p><b>Literacy and Numeracy</b> D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19</p>
7	<p><b>Lecture: Morgan</b></p> <ul style="list-style-type: none"> <li>Planning Units of Work: using the Stage 4/5 Syllabus</li> </ul> <p><b>Microteaching</b></p>	<p><b>Lecture: Ming</b></p> <ul style="list-style-type: none"> <li>Planning Units of Work: using the Stage 4/5 Syllabus</li> </ul> <p><b>Microteaching</b></p>



10 Apr & 13 Apr	<b>Tutorial: Morgan, Miano</b> Developing a Unit of work for Stage 4/5 <b>Classroom Management</b> B1, 5, 7, 10 <b>ICT</b> C1,2,3,4,5,6,7,8,9,10,12,14 <b>Literacy and Numeracy</b> D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19	<b>Tutorial: Ming, Kaddour</b> Developing a Unit of work for Stage 4/5 <b>Classroom Management</b> B1, 5, 7, 10 <b>ICT</b> C1,2,3,4,5,6,7,8,9,10,12,14 <b>Literacy and Numeracy</b> D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19
<b>Mid-semester break</b>		
8 24 Apr & 27 Apr	<b>Lecture: Morgan</b> <ul style="list-style-type: none"> <li>Strategies to improve literacy in Stage 4/5</li> </ul> <b>Microteaching</b> <b>Tutorial: Morgan, Miano</b> Strategies to improve literacy in Stage 4/5 <b>Literacy and Numeracy</b> D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19	<b>Lecture: Kaddour</b> <ul style="list-style-type: none"> <li>Strategies to improve numeracy in Stage 4/5</li> </ul> <b>Microteaching</b> <b>Tutorial: Ming, Kaddour</b> Strategies to improve numeracy in Stage 4/5 <b>Literacy and Numeracy</b> D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19
9 1 May & 4 May	<b>Lecture: Morgan</b> <ul style="list-style-type: none"> <li>Overview and philosophy of Stage 6 syllabuses, including:             <ul style="list-style-type: none"> <li>Inquiry questions</li> <li>Inclusion of skills</li> <li>Need for contextualisation</li> </ul> </li> </ul> <b>Microteaching</b> <b>Tutorial: Morgan, Miano</b> Deconstruction of one Stage 6 syllabus <b>Literacy and Numeracy</b> D1, 2, 3	<b>Lecture: Ming</b> <ul style="list-style-type: none"> <li>Lesson planning in Stage 6</li> </ul> <b>Microteaching</b> <b>Tutorial: Ming, Kaddour</b> Planning lessons in Stage 6 <b>Literacy and Numeracy</b> D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19
10 8 May & 11 May	<b>Lecture: Morgan</b> <ul style="list-style-type: none"> <li>Lesson Planning for Stage 6 Practical Work</li> </ul> <b>Tutorial: Morgan, Miano</b> Lesson Planning for Stage 6 Practical Work <b>Literacy and Numeracy</b> D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19 <b>Classroom Management</b> B1, 5, 7, 10	<b>Lecture: Ming</b> <ul style="list-style-type: none"> <li>Preparing for Professional Experience</li> <li>Completion of CATEI reports</li> </ul> <b>Tutorial: Ming, Kaddour</b> Organisational strategies <b>Classroom Management</b> B1, 5, 7, 10 <b>ICT</b> C1,2,3,4,5,6,7,8,9,10,12,14 <b>Literacy and Numeracy</b> D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19
<b>Professional Experience</b>		
11 19 Jun & 22 Jun	<b>Lecture: Morgan</b> <ul style="list-style-type: none"> <li>Feedback and Reflection on PE1:             <ul style="list-style-type: none"> <li>highs and lows</li> <li>areas you improved the most</li> <li>areas you still need to work on</li> <li>useful strategies for Stage 4/5</li> </ul> </li> </ul> <b>Tutorial: Morgan, Kaddour</b> Goals for Method 2 Planning for next Professional Experience	<b>Lecture: Miano</b> <ul style="list-style-type: none"> <li>Feedback and Reflection on PE1:             <ul style="list-style-type: none"> <li>inspiring use of ICT</li> <li>inspiring use of contemporary teaching resources</li> <li>useful strategies for Stage 6</li> </ul> </li> </ul> <b>Tutorial: Miano, Kaddour</b> Goals for Method 2 Planning for next Professional Experience

## 7. ASSESSMENT

Assessment Task	Length	Weight	Student Learning Outcomes Assessed	Program Learning Outcomes Assessed	National Elaborations	Due Date Friday of
<b>Task 1</b> Teaching the Nature and Practice of Science	2000 words	20%	1, 3, 4, 5, 6, 8	1.2, 1.3, 2.1, 2.2, 2.3, 2.5, 2.6, 3.1, 3.2, 3.4, 3.5, 4.2, 4.4	D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19	Week 4 24 March
<b>Task 2</b> ICT Portfolio	2000 words	20%	1, 2, 3, 4, 6	1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 4.2, 6.3	A 3, 5, 8 C1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14 D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19	Week 6 7 April
<b>Task 3</b> Microteaching	N/A	S/N	1, 2, 3, 4, 5, 6, 7, 8	1.2, 1.3, 2.1, 2.2, 2.3, 2.6, 3.1, 3.2, 3.3, 3.4, 3.5, 4.2, 4.4, 6.3	B1, 5, 7, 10 D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19	Weeks 4 - 9
<b>Task 4</b> Unit of Work	3000 words	30%	1, 2, 3, 4, 5, 6, 7, 8	1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.4, 3.5, 4.2, 4.4	A 3, 5, 8 D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19	Week 10 12 May
<b>Task 5</b> Critical Reflection and Contributions to forums	3000 words	30%	1, 2, 3, 4, 5, 6, 7, 8	1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 4.2, 4.4, 6.3	A 3, 5, 8 C1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14 D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19	Weeks 1 - 10

Students are required to follow their lecturer's instructions when submitting their work for assessment. All assessment will be submitted online via Moodle by 5pm. Student no longer need to use a cover sheet. Students are also required to keep all drafts, original data and other evidence of the authenticity of the work for at least one year. 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.

## *Assessment Details*

### **Task 1 - Teaching the Nature and Practice of Science**

You are to produce three resources to teach the Nature and Practice of Science. Prior to commencing the task, you are encouraged to review the readings linked in the “Scientific Literacy” tab of Moodle.

The resources could take the following forms:

- A narrative from the history of Science, accompanied by a set of questions with sample answers
- A narrative from contemporary Science, accompanied by a set of questions with sample answers
- A research task about an aspect of Science that illustrates the Nature and Practice of Science, accompanied by a report scaffold.
- An activity of your choice

Each resource should be mapped to the Stage 4/5 Syllabus outcomes and content statements.

**NB. ALL OUTCOMES AND CONTENT STATEMENTS MUST BE WRITTEN AS FULL STATEMENTS, ACCOMPANIED BY THEIR IDENTIFYING NUMBER**

The assessment task is to be converted to a PDF with the student name in the title of the file and submitted via Moodle.

## Task 2 - ICT PORTFOLIO

You are to produce a portfolio of ICT-based activities. The activities should be as follows:

- **three** activities that make use of Web 2.0 tools or Web Apps, eg an online timeline maker or a collaborative flow chart  
**AND**
- **three** activities that are based on the use of an online simulation of a scientific principle  
**AND**
- **two** activities that are based on websites that focus on Aboriginal and Torres Strait Islander Science  
**AND**
- **three** content-based websites.

The activities should be linked to any of the Science syllabuses, and should relate to a specific activity (not generic) that can be performed in a Science lesson, to address a syllabus content statement and/or outcome.

For **each** ICT activity you should include:

- an identification of the course and/or stage you would use the ICT with
- a brief discussion on the potential for student engagement
- links to the syllabus, including outcomes **and** content statements
- an illustrated description of each how you would use each activity in a specific lesson
- screenshot(s) to illustrate the use of the ICT
- hyperlinks for simulations, websites and Web 2.0 tools or Apps.

The Web 2.0 tools or Apps you present should be freely available to any student without cost.

You **MUST** present your portfolio as a website, using a free website builder such as Wix, Weebly, Wikispaces or Google Sites. If possible, you should embed a "Date Last Edited" code into your website.

The assessment task is to be submitted as a hyperlink in Moodle.

If your work is not public, you should provide the lecturer with a password. Marks will be deducted if the marker encounters difficulty in accessing your site.

**NB. ALL OUTCOMES AND CONTENT STATEMENTS MUST BE WRITTEN AS FULL STATEMENTS, ACCOMPANIED BY THEIR IDENTIFYING NUMBER.**

## HURDLE REQUIREMENT – TASK 3 MICROTACHING

Microteaching is the planning, presentation and evaluation of a lesson over a shortened period of time (a 20-minute mini-lesson). It is a critical aspect of method as it provides students with the opportunity to demonstrate key competencies that must be achieved before student teachers are permitted to undertake Professional Experience 1, at the same time observing other student teachers and engaging in peer review. It is recommended that students read widely on effective classroom strategies and practise aspects of their mini-lesson with a small group of peers prior to assessment.

The assessment process will consist of the following two components:

1. A detailed **lesson plan using the prescribed SED template**, including a statement of expected learning outcomes
2. A 20-minute mini-lesson, derived from the full lesson plan.

**Initial Lesson Plan:** You are to prepare a lesson plan from Stage 4 or 5, for a 20 minute lesson that includes a practical demonstration by the teacher, using readily available materials. You must use the SED template provided to you in lectures. The main focus of the lesson should be on the delivery by the teacher of some science content and/or skills, supported by a demonstration. You should explicitly state the learning outcomes expected at the beginning of your lesson. Explicit teaching/acknowledgement of the literacy/numeracy needs required to access the content of the lesson must be included.

The final lesson plan should be submitted to the tutor via email on the day the lesson is presented, and should include:

- an overview of the main ideas presented
- the expected student outcomes and content statements covered explicitly stated
- a brief description of where the lesson fits into the topic from which it is derived
- a description of the steps in the lesson and the time taken for each step
- a full description of the demonstration
- a brief activity that addresses literacy or numeracy

**A 20-minute mini-lesson:** This will be assessed according to the attached criteria, and will be graded as **Satisfactory or Unsatisfactory**. Any student whose first microteaching episode is judged as unsatisfactory will be given a further (one only) opportunity to gain a satisfactory grade.

**NOTE: If a student is assessed as unsatisfactory in microteaching s/he will automatically fail Method 1 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.**

NB. ALL OUTCOMES AND CONTENT STATEMENTS MUST BE WRITTEN AS FULL STATEMENTS, ACCOMPANIED BY THEIR IDENTIFYING NUMBER

#### Task 4 UNIT OF WORK FOR STAGE 4 or 5 SCIENCE

You are to design a unit of work that focuses on a concept or topic suitable for a Stage 4 or 5 Science class.

Your unit of work should have an **appropriate and engaging context**. You must present an outline for a unit to be taught over a 4-week teaching period, of 3 x 80 minute periods per week, i.e. 12 80-minute lessons.

The unit outline should be in a standard format that will be explained and investigated during lectures and tutorials. You will receive a **template** for the unit outline which you must use.

- The introductory page of your unit must clearly outline the **context** of the unit and a **rationale** for it. It should also state the syllabus outcomes for the unit as a whole, including Knowledge and Understanding, Values and Attitudes and Working Scientifically Skills. It should describe the prior learning students must have to begin this unit and discussion of how this prior knowledge could be assessed.
- The rationale (of about 300 words), should:
  - state succinctly what you want the students to learn and why it is important
  - describe and justify your chosen context and why you expect it will be able to engage student interest
  - justify your choice of content and teaching strategies and relate them to the needs and abilities of this class.
- Your unit of work must have an embedded context and employ a logically sequenced series of lesson outlines, utilising a **variety of teaching strategies**. There should be potential for student engagement with the material taught.
- The outline for each lesson must include the syllabus content statements derived from the syllabus outcomes. The teaching strategies you select must target these syllabus content statements.
- The unit of work must include lessons that target the following:
  - The Nature or the History of Science**
  - Incorporation of ICT**, both as a teaching strategy and as a student skill.
- The unit of work must include lessons that target the following:
  - **Literacy**
  - **Numeracy**
  - One or more **Values and Attitudes** outcomes.
- So that the marker can determine the link between teaching strategies and the syllabus, all syllabus references should be written as complete statements.

The assessment task is to be converted to a PDF with the student name in the title of the file and submitted via Moodle.

NB. ALL OUTCOMES AND CONTENT STATEMENTS MUST BE WRITTEN AS FULL STATEMENTS, ACCOMPANIED BY THEIR IDENTIFYING NUMBER.

## **Task 5 CRITICAL REFLECTION AND CONTRIBUTIONS TO CLASS FORUMS**

In this course there will be some assessable Moodle discussions initiated by lecturers. Students must make an initial contribution to each of these discussions, as well as post reflective replies to the contributions of other students.

For each forum question, students should frame their response in terms of the key concepts covered in lectures. These could include, but are not limited to:

- the nature of learning in Science
- the nature of science
- the skills and experiences you could bring to your Science lessons
- the diverse social, cultural, ethnic and religious backgrounds of students, and the effects of these factors on learning
- strategies to meet the learning needs of ATSI students
- students' varied approaches to learning
- the importance of literacy and numeracy
- how students' skills, interests and prior achievements affect learning
- strategies for addressing individual student needs
- creating an environment of respect and rapport
- establishing a climate where learning is valued and students' ideas are respected
- analysis and reflection on teaching practice.

NB. This task should be submitted to the appropriate Moodle forum.

In addition to posting to the forums, students are expected to make a significant contribution to the resources developed during tutorials. Class wikis and/or forums will be set up to allow collaboration and sharing of resources amongst students. Students will be assigned to tutorial groups in Moodle, and will be required to contribute to the wiki and/or forums as a group.

The tutorial grade will be determined by the quality and frequency of contributions to the wikis and /or forums. The grade received for the forums described above will be moderated according to the tutorial grade.

## Resources

The Flipped Classroom,  
<http://www.teacherstandards.aitsl.edu.au/Illustrations/ViewIOP/IOP00173/index.html>

**TPACK** (created by Dr. Matthew Koehler and Dr. Punya Mishra <http://www.tpack.org/>), Technological Pedagogical Content Knowledge (TPACK) is a framework that identifies the knowledge teachers need to teach effectively with technology.

**S A M R** (created by Dr. Ruben R. Puentedura); provides a framework to answer the question of what types of technology use would have greater or lesser effects upon student learning.

**Rural & Distance Education NSW**: A local resource presenting both frameworks,  
<http://rde.nsw.edu.au/tpack-samr>

**Teaching Teachers for the Future - What is TPACK?** <http://www.ttf.edu.au/what-is-tpack/what-is-tpack.html>

Reflections of pre-service teachers, <http://www.ttf.edu.au/psts-talk.html>; this series of video clips shows the reflections of several pre-service teachers each of whom trialled one of the twelve Teaching Teachers for the Future (TTF) Australian Curriculum resource packages with a practicum class. At the end of their lesson the pre-service teachers were invited to reflect on the experience of working with the resource package and adapting it to their class situation. They were also asked to reflect on their understanding of TPACK.

Student teachers are encouraged to set up their own blog (It is free) at Edublog , <http://edublogs.org/> to create and share resources and lessons they create.

### *Return of Assessment Tasks*

Feedback for Assessment Tasks will be delivered via a feedback sheet in Moodle.

### *Feedback*

<b>Assessment Task</b>	<b>Feedback Mechanism</b>	<b>Feedback Date</b>
<b>Task 1</b> Stage 6 Lesson Plan	Feedback sheet via Moodle	Week 7 Thursday 13 April
<b>Task 2</b> ICT Portfolio	Feedback sheet via Moodle	Week 9 Friday 5 May
<b>Task 3</b> Microteaching	Written feedback sheet	One week after delivery of Microteaching lesson
<b>Task 4</b> Unit of Work	Feedback sheet via Moodle	Friday 3 June
<b>Task 5</b> Critical Reflection and Contributions to forums	Feedback sheet via Moodle	Friday 3 June



## 8. RESOURCES

### Textbook details

Each student is required to obtain from the Board of Studies website the following Board of Studies documents: Stage 4/5 Science Syllabus, one Stage 6 Science syllabus (i.e., Physics, Chemistry, Biology or Earth and Environmental Science) and the Stage 4/5 and 6 Support Documents.

It is not necessary to purchase High School Science text books for this course. Textbooks will not usually be used during tutorials.

### Optional Senior Textbooks

Chidrawi G, Robson, M., Hollis. S. (2008) Biology in Focus

Smith, R (2004) Conquering Chemistry 4<sup>th</sup> Edition

Xiao L. Wu, Farr, R. (2009) Physics in Focus

### Optional Junior Textbooks

Jenny Zhang, Diane Alford, David McGowan, Craig Tilley (2013) Oxford Insight Science 9 &10 (oBook version)

### Additional 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*. All and Unwin, Crows Nest.
- **Bryson, B. (2004) A Short History of Nearly Everything, Black Swan, London**
- 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
- Hazzard, J. (2004) *The Art of Teaching Science: Inquiry and Innovation in Middle School and High School*
- 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
- 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

### Recommended websites

NSW Board of Studies

<http://www.boardofstudies.nsw.edu.au/>

Science Teachers Association of NSW

<http://www.stansw.asn.au>

UNSW SCHOOL OF EDUCATION  
FEEDBACK SHEET  
EDST6713 SCIENCE DOUBLE METHOD 1

Student Name:  
Task 1 - Teaching the Nature and Practice of Science

SPECIFIC CRITERIA	(-)	—————▶			(+)
<b>Understanding of the question or issue and the key concepts involved</b> <ul style="list-style-type: none"> <li>• understanding of the Nature and Practice of Science and its relationship to effective Science teaching</li> <li>• clarity and accuracy in use of key terms and concepts in Science teaching</li> </ul>					
<b>Depth of analysis and/or critique in response to the task</b> <ul style="list-style-type: none"> <li>• appropriate selection of student activities</li> <li>• depth of knowledge of the NSW syllabus documents and other relevant curriculum documents</li> <li>• appropriate selection of syllabus outcomes and content</li> <li>• links between syllabus outcomes and the chosen activities evident</li> <li>• appropriate choice of teaching strategies</li> <li>• Questions and sample answers demonstrate depth of understanding of the syllabus and the nature and practice of Science</li> </ul>					
<b>Familiarity with and relevance of professional and/or research literature used to support response</b> <ul style="list-style-type: none"> <li>• reference specifically to material, research and ideas presented in Science method lectures</li> </ul>					
<b>Structure and organisation of the response</b> <ul style="list-style-type: none"> <li>• appropriateness of overall structure of response</li> <li>• clarity and coherence of organisation; logical sequence</li> <li>• use of appropriate format</li> </ul>					
<b>Presentation of response according to appropriate academic and linguistic conventions</b> <ul style="list-style-type: none"> <li>• clarity, consistency and appropriateness of conventions for quoting, citing, paraphrasing, attributing sources of information, and listing references (APA style)</li> <li>• clarity and appropriateness of sentence structure, vocabulary use, spelling, punctuation and word length</li> </ul>					
<b>GENERAL COMMENTS</b>					

**Lecturer Recommended:**      /20      (FL PS CR DN HD)

**Date Weighting:**      20%

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  
EDST6713 SCIENCE DOUBLE METHOD 1

Student Name:  
Task 2 – ICT Portfolio

SPECIFIC CRITERIA	(-)  (+)				
<b>Understanding of the question or issue and the key concepts involved</b> <ul style="list-style-type: none"> <li>• understanding of the task, including               <ul style="list-style-type: none"> <li>- a reflective discussion of the potential for student engagement</li> <li>- links to the syllabus, including outcomes and content statements</li> <li>- illustrated descriptions of each how the activity could be used,</li> <li>- screenshot(s) to illustrate the use of the ICT</li> <li>- hyperlinks for animations, websites and Web 2.0 tools or Apps</li> </ul> </li> <li>• clarity and accuracy in use of key terms and concepts in Science teaching</li> </ul>					
<b>Depth of analysis and/or critique in response to the task</b> <ul style="list-style-type: none"> <li>• ability to plan and assess for effective learning by designing lesson sequences using knowledge of the NSW syllabus documents or other curriculum requirements of the Education Act</li> </ul>					
<b>Familiarity with and relevance of professional and/or research literature used to support response</b> <ul style="list-style-type: none"> <li>• reference specifically to material, research and ideas presented in Science method lectures and from the Professional Experience lectures.</li> </ul>					
<b>Structure and organisation of the response</b> <ul style="list-style-type: none"> <li>• clarity and coherence of organisation; logical sequence</li> <li>• material presented in an engaging way</li> <li>• appropriate construction of a functional website</li> </ul>					
<b>Presentation of response according to appropriate academic and linguistic conventions</b> <ul style="list-style-type: none"> <li>• clarity, consistency and appropriateness of conventions for quoting, citing, paraphrasing, attributing sources of information, and listing references (APA style)</li> <li>• clarity and appropriateness of sentence structure, vocabulary use, spelling, punctuation and word length</li> </ul>					
<b>GENERAL COMMENTS</b>					

**Lecturer Recommended:**        /20        (FL PS CR DN HD)

**Date Weighting:**        20%

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**STUDENT TEACHER**

Name:	Date:
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Details	
Method	Topic/level

Standards	Comments
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<p><b>A. Teachers know their subject content and how to teach that content to their students (AITSL Standard 2)</b></p> <ul style="list-style-type: none"> <li>• Was the lesson or unit of work relevant to the needs of the students and based on the appropriate syllabus document requirements? (1.3.1, 2.3.1)</li> <li>• Was knowledge of relevant concepts, topics and themes demonstrated, including ATSI perspectives? (2.1.1, 2.4.1)</li> <li>• Were relevant linguistic structures and features and literacy /numeracy knowledge and skills integrated into the lesson? (2.5.1)</li> <li>• Was a clear and coherent sequence of activities undertaken to engage and support the learning of all students within a class or cohort? (2.2.1, 3.2.1)</li> <li>• Were the teaching resources and materials suitable for the aims of the lesson? (2.1.1)</li> <li>• Were tasks required of students modelled and scaffolded? (2.1.1, 3.3.1)</li> </ul>	
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<p><b>B. Teachers plan for and implement effective teaching and learning (AITSL Standard 3)</b></p> <ul style="list-style-type: none"> <li>• Were challenging yet realistic and achievable goals in teaching and learning activities planned? Were these explicitly articulated in the lesson plan/to students? (3.1.1)</li> <li>• Were instructions, explanations and questioning techniques effective? (3.3.1)</li> <li>• Were verbal and non-verbal communication strategies used effectively in the classroom to support student understanding of content and encourage participation and engagement of students? (3.5.1)</li> <li>• Was students' understanding continually monitored and students' achievement of the learning outcomes noted? (3.6.1)</li> </ul>	
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<p><b>C. Teachers create and maintain supportive and safe learning environments (AITSL Standard 4)</b></p> <ul style="list-style-type: none"> <li>• Was rapport with the learners established and responsiveness to their needs in the class demonstrated? (4.1.1)</li> <li>• Were activities well organised and direction clear? (4.2.2)</li> <li>• Was respect and appreciation of others demonstrated through active listening, being accessible to all students and exhibiting a caring attitude? (4.1.1, 4.4.1, 1.1.1)</li> </ul>	
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<p><b>Comments:</b></p>
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Lecturer: \_\_\_\_\_ Date: \_\_\_\_\_ Satisfactory /Unsatisfactory (circle)

UNSW SCHOOL OF EDUCATION  
FEEDBACK SHEET  
EDST6713 SCIENCE DOUBLE METHOD 1

Student Name:  
Task 4 – Unit of Work for Stage 4 or 5 Science

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, including both a rationale and a unit of work including the nature and history of science, working scientifically skills, literacy &amp; numeracy activities, appropriate ICTs, values and attitudes, clarity and accuracy in use of key terms and concepts in lesson and unit planning</li> </ul>			
<p><b>Depth of analysis and/or 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 lesson sequences using knowledge of the NSW syllabus documents or other curriculum requirements of the Education Act, including:               <ul style="list-style-type: none"> <li>○ an appropriate and engaging context and a justification the chosen context</li> <li>○ linkage to syllabus outcomes covered by the unit as a whole, including Knowledge and Understanding, Values and Attitudes and Working Scientifically skills</li> <li>○ appropriate content and teaching strategies targeting Knowledge and Understanding outcomes</li> <li>○ appropriate content and teaching strategies targeting Working Scientifically Skill outcomes</li> <li>○ appropriate content and teaching strategies targeting Values and Attitudes outcomes</li> <li>○ appropriate content and teaching strategies targeting the Nature or History of Science</li> <li>○ appropriate content and teaching strategies targeting Incorporation of ICT, both as a teaching strategy and as a student skill</li> <li>○ appropriate content and teaching strategies targeting literacy</li> <li>○ appropriate content and teaching strategies targeting numeracy</li> </ul> </li> <li>• design of a unit outline               <ul style="list-style-type: none"> <li>○ which demonstrates an ability to cater for diverse learning approaches and needs whilst ensuring student engagement with the material taught</li> <li>○ which uses teaching strategies related to the needs and abilities of the class</li> </ul> </li> <li>• demonstration of knowledge of, and respect for, the diverse social, ethnic, cultural and religious backgrounds of students and the effects of these factors on learning</li> </ul>			
<p><b>Familiarity with and relevance of professional and/or research literature used to support response</b></p> <ul style="list-style-type: none"> <li>• reference specifically to material, research and ideas presented in Science method lectures and from the Professional Experience lectures.</li> </ul>			
<p><b>Structure and organisation of the response</b></p> <ul style="list-style-type: none"> <li>• appropriateness of overall structure of response</li> <li>• clarity and coherence of organization; logical sequence</li> <li>• use of appropriate format</li> </ul>			
<p><b>Presentation of response according to appropriate academic and linguistic conventions</b></p> <ul style="list-style-type: none"> <li>• contributions are complete and of a standard suitable for use with secondary school students</li> <li>• clarity and appropriateness of sentence structure, vocabulary use, spelling, punctuation and word length</li> </ul>			
<b>GENERAL COMMENTS</b>			

**Lecturer**

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

**Date**

**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 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  
EDST6713 SCIENCE DOUBLE METHOD 1

Student Name:  
Task 5 – Critical Reflection

SPECIFIC CRITERIA	(-) <span style="font-size: 2em;">→</span> (+)				
<b>Understanding of the question or issue and the key concepts involved</b> <ul style="list-style-type: none"> <li>understanding of the task by clearly identifying and responding to the main issues raised in the forum and their relationship to relevant areas of theory, research and practice</li> </ul>					
<b>Depth of analysis and/or critique in response to the task</b> <ul style="list-style-type: none"> <li>Depth of analysis in initial response to forum posts by lecturers</li> <li>Depth of analysis in response to forum posts by other students</li> </ul>					
<b>Familiarity with and relevance of professional and/or research literature used to support response</b> <ul style="list-style-type: none"> <li>Responses include reference specifically to material, research and ideas presented in Science method lectures and from the Professional Experience lectures.</li> </ul>					
<b>Structure and organization of the response</b> <ul style="list-style-type: none"> <li>ongoing engagement with forum, class wikis/discussions in Moodle maintained throughout the course</li> <li>Engagement with forums and/or class wikis in Moodle maintained in a timely manner</li> </ul>					
<b>Presentation of response according to appropriate academic and linguistic conventions</b> <ul style="list-style-type: none"> <li>contributions are complete and of a suitable standard</li> <li>clarity and appropriateness of sentence structure, vocabulary use, spelling, punctuation and word length</li> </ul>					
<b>GENERAL COMMENTS</b>					

**Lecturer Recommended:**      /20      (FL PS CR DN HD)

**Date 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 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.**