School of Education

EDST6713
Science Double Method 1

Semester 1, 2018

Contents

1. **LOCATION**
2. **STAFF CONTACT DETAILS**

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:

> Task 5 Critical Reflection forum will consist of a blog which critically analyses student progress towards completion of assessment tasks
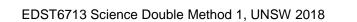
Important information
Assessment: Please note that all students must pass all assignments to pass the course, and they must pass the course to go on placement for PE 1.

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	
1	Identify foundational aspects and structure of the NSW Board of Studies

E. Students with Special Educational Needs	1, 2, 3, 4, 5, 6, 7, 8, 9
F. Teaching Students from Non-English Speaking Backgrounds	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

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 Monday's tutorial and 7.15pm on Thursday's tutorial evening. This work will be monitored, and will contribute to the total grade for each student. A debriefing session will be conducted after work submission 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 26 Feb – 2 Mar	**Lecture:** Introduction to course structure and requirements Where to find information and resources Discussion of assigned reading related to - Why do Science? - The nature of Science - What is Science Literacy? -The role of the Nature and Practice of Science in Science teaching **Tutorial:** What should be the nature of Science teaching in contemporary schools? **Literacy and Numeracy** D1, 2, 3	**Lecture:** Discussion of assigned reading related to -The role of the History of Science in Science teaching - Developing contexts – making Science relevant **Tutorial:** Developing contexts to incorporate the Nature of Science, the History of Science and the Working Scientifically skills **ICT** C1,2,3,4,5,6,7,8,9,10,12,14 **Literacy and Numeracy** D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19

2
4 Mar
–
9 Mar
	Lecture:
	    Deconstructing the Stage 4/5 Syllabus: structure & requirements
	Tutorial:
	Analysing the syllabus and associated documents
	ICT
	C1,2,3,4,5,6,7,8,9,10,12,14
	Literacy and Numeracy
	D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19
		Lecture:
		    Teaching strategies for Science
		Tutorial:
		Developing a repertoire of teaching strategies for Science teaching; catering for diverse learners
		Classroom Management
		B1, 5, 7, 10
		ICT
		C1,2,3,4,5,6,7,8,9,10,12,14
		Literacy and Numeracy
		D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19	

3
12 Mar
–
16 Mar
	Lecture:
	    Incorporating ICT into Science lessons
	Microteaching
	Tutorial:
	Planning Stage 4/5 lessons using ICT
	Literacy and Numeracy
	D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19
		Lecture:
		    Using the syllabus to plan Stage 4/5 lessons
		Microteaching
		Tutorial:
		Planning Stage 4/5 lessons
		Classroom Management
		B1, 5, 7, 10
		ICT
		C1,2,3,4,5,6,7,8,9,10,12,14
		Literacy and Numeracy
		D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19	

4
19 Mar
–
23 Mar
	Lecture:
	    Practical Work and the Working Scientifically Outcomes, including the incorporation of literacy and numeracy strategies
	Microteaching
	Tutorial:
	Developing a repertoire of teaching strategies for Science teaching – practical work
	Literacy and Numeracy
	D1, 2, 3, 5, 6 8
		Lecture:
		    Safety in the Science Laboratory
		Microteaching
		Tutorial:
		Developing a repertoire of teaching strategies for Science teaching – practical work
		Literacy and Numeracy
		D1, 2, 3, 5, 6 8	

7 16 Apr – 20 Apr	**Lecture:** Planning Units of Work: using the Stage 4/5 Syllabus **Microteaching** **Tutorial:** Developing a Unit of work for Stage 4/5 **Classroom Management** B1, 5, 7, 10 **ICT** C1,2,3,4,5,6,7,8,9,10,12,14 **Literacy and Numeracy** D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19	**Lecture:** Planning Units of Work: using the Stage 4/5 Syllabus **Microteaching** **Tutorial:** Developing a Unit of work for Stage 4/5 **Classroom Management** B1, 5, 7, 10 **ICT** C1,2,3,4,5,6,7,8,9,10,12,14 **Literacy and Numeracy** D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19
8 23 Apr – 27 Apr ANZAC Day 25th April	**Lecture:** Strategies to improve numeracy in Stage 4/5 **Microteaching** **Tutorial:** Strategies to improve numeracy in Stage 4/5 **Literacy and Numeracy** D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19	**Lecture:** Strategies to improve literacy in Stage 4/5 **Microteaching** **Tutorial:** Strategies to improve literacy in Stage 4/5 **Literacy and Numeracy** D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19
9 30 Apr – 4 May	**Lecture:** Overview and philosophy of Stage 6 syllabuses, including: - Inquiry questions - Inclusion of skills - Need for contextualisation **Microteaching** **Tutorial:** Deconstruction of one Stage 6 syllabus **Literacy and Numeracy** D1, 2, 3	**Lecture:** Lesson planning in Stage 6 **Microteaching** **Tutorial:** Planning lessons in Stage 6 **Literacy and Numeracy** D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19
10 7 May – 11 May	**Lecture:** Lesson Planning for Stage 6 Practical Work **Tutorial:** Lesson Planning for Stage 6 Practical Work **Literacy and Numeracy** D1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19 **Classroom Management** B1, 5, 7, 10	**Lecture:** Preparing for Professional Experience Completion of CATEI reports **Tutorial:**

7. ASSESSMENT

Assessment Task	Length	Weight	Student Learning Outcomes Assessed	AITSL Standards	National Priority Area Elaborations	Due Date Friday of
Task 1 Lesson Plan	2000 words	20%	1, 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	A 3, 5, 8 B1, 5, 7, 10 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 4 23 March
Task 2 ICT Portfolio	3500 words	30%	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 13 April

Assessment Details

Task 1 – LESSON PLAN

Plan and design one 60-minute lesson for a mixed-ability Stage 4 class. The lesson plan must follow a standard SED format and be presented using the template provided.

Plan your lesson for a class in a comprehensive high school which would typically include EAL/D students, Indigenous students and students with various religious and cultural backgrounds. Some students may have low levels of literacy. Differentiation to cater for some students is therefore required. Appropriate differentiation strategies are scaffolding, group work and/or an alternative task or mode of presentation.

1. Write a rationale for your lesson plan. Your rationale should address the questions: What do I want the students to learn? Why is it important? What strategies will I use? What assessment for learning strategies will I use to monitor progress?

2. Prepare the lesson plan to demonstrate how you will use appropriate structure, activities, strategies and formative assessment to develop understanding of the material.

Make sure you

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 Apps, eg an online timeline maker or a collaborative flow chart
   AND
   three activities that are based on the use of different online simulations of a scientific principles
   AND
   one activity that is based on websites that focus on Aboriginal and Torres Strait Islander Science

The activities should be linked to the 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, includin/F7 9.96 Tf1 0 0 1 72.024 555.43 Tm0 g0 G2078}TJETQq0.000008871 0 595.32 0 0 1

HURDLE REQUIREMENT – TASK 3 MICROTEACHING

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.

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 foc139.871 09T/F1 9.96 Tf1q00 1 72.024 749.4 Tm0 g0 G

Task 4 UNIT OF WORK FOR STAGE 4 or 5 SCIENCE

Prepare an outline for a unit of work for a Stage 5 class. The unit of work should cover the first five lessons, which are 80 minutes each; however, you are not preparing full lesson plans.

You must write a rationale for the unit (600-800 words) in which you

> provide a brief outline of the school and class context
> state precisely what you want the students to learn and why it is important
> describe and justify your choice of context to suit the needs and abilities of this class
> justify your teaching strategies by referring to readings, research and material presented in lectures and the Quality Teaching framework
> demonstrate how differentiation will support a diverse range of learners
> describe the prior knowledge students have to begin this unit and discuss how you would assess and build on this prior knowledge.

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

Bill Matchett, Dr Silvia Rudmann, Sarah Collins, Kirstin Ellard (2018) Investigating Science in Focus Preliminary Student Book

Glenda Chidrawi, Sarah Bradstock, Margaret Robson, Elizabeth Thrum (2018) Biology in Focus Year 11 Student Book

Roland Smith , Anna Davis (2018) Chemistry in Focus Prelim 11 Student Book

Kate Wilson, Rob Farr, Philip Young (2018) Physics in Focus Year 11 Student Book

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) T*eaching 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
NESA

Science Teachers Association of NSW
http://www.stansw.asn.au

Student Name:

Task 1 – Lesson Plan

SPECIFIC CRITERIA	(-) ——————— (+)
Understanding of the question or issue and the key concepts involved	

Student Name:

Task 2 – ICT Portfolio

SPECIFIC CRITERIA	(-)				(+)
Understanding of the question or issue and the key concepts involved understanding of the task, including - a reflective discussion of the potential for student engagement - links to the syllabus, including outcomes and content statements - illustrated descriptions of each how the activity could be used, - screenshot(s) to illustrate the use of the ICT - hyperlinks for animations, websites and Web 2.0 tools or Apps clarity and accuracy in use of key terms and concepts in Science teaching					
Depth of analysis and/or critique in response to the task 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					
Familiarity with and relevance of professional and/or research literature used to support response reference specifically to material, research and ideas presented in Science method lectures and from the Professional Experience lectures.					
Structure and organisation of the response clarity and coherence of organisation; logical sequence material presented in an engaging way appropriate construction of a functional website					
Presentation of response according to appropriate academic and linguistic conventions clarity, consistency and appropriateness of conventions for quoting, citing, paraphrasing, attributing sources of information, and listing references (APA style) clarity and appropriateness of sentence structure, vocabulary use, spelling, punctuation and word length					
GENERAL COMMENTS					

STUDENT TEACHER

Name:	Date:

Details

Method		Topic/level	

Standards	**Comments**
A. Teachers know their subject content and how to teach that content to their students (AITSL Standard 2) • 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) • Was knowledge of relevant concepts, topics and themes demonstrated, including ATSI perspectives? (2.1.1, 2.4.1) • Were relevant linguistic structures and features and literacy /numeracy knowledge and skills integrated into the lesson? (2.5.1) • 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) • Were the teaching resources and materials suitable for the aims of the lesson? (2.1.1) • Were tasks required of students modelled and scaffolded? (2.1.1, 3.3.1)	
B. Teachers plan for and implement effective teaching and learning (AITSL Standard 3) • 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) • Were instructions, explanations and questioning techniques effective? (3.3.1) • 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) • Was students' understanding continually monitored and students' achievement of the learning outcomes noted? (3.6.1)	

C. Teachers create and maintain supportive and safe learning environments (AITSL Standard 4)
• Was rapport with the learners established and responsiveness to their needs in the class demonstrated? (4.1.1)

Student Name:

Task 5 – Learning Log and Contributions to Class forums

SPECIFIC CRITERIA	(-)				(+)

Understanding of the question or issue and the key concepts involved
    understanding of the task by clearly identifying and responding to the main
    issues raised in lectures and assessment tasks and their relationship to
    relevant areas of theory, research and practice					

Depth of analysis and/or critique in response to the task
    Depth of analysis in personal blog posts
    Depth of analysis in response to blog posts by other students					

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