

<b>Subject Title:</b>	Science Secondary Curriculum 1		
<b>Subject Code:</b>	EDU4SE1	<b>Credit Points:</b>	15
<b>Teaching Period:</b>	Trimester 1	<b>Mode:</b>	Blended
<b>Prerequisite:</b>		<b>Level:</b>	4
<b>Subject Description:</b>			
<p>This subject is taken by all pre-service teachers studying a science method (Biology, Chemistry, General Science, Physics) and is a general introduction to teaching science in secondary schools.</p> <p>In this subject knowledge and skills are developed about pedagogical content knowledge, planning, implementation, assessment and reporting, and reflection. The emphasis is on effective teaching and learning within an Australian context for Science Years 7-10, drawing upon the examples of current curriculum and professional frameworks.</p> <p>Pre-service teachers consider, demonstrate and reflect upon a professional understanding of teaching method-specific concepts, issues and developments, safety, where applicable, and legal responsibilities, application of learning technologies, audio-visual materials, and resources.</p>			
<b>Intended Learning Outcomes (ILOs) &amp; Australian Professional Standards for Teachers (APST)</b>			
Upon successful completion of this subject, you will be able to:		APST	
1	Demonstrate knowledge of the concepts, skills, structure of the content and teaching strategies of Science Education, and an in-depth understanding of how students learn in Science.	1.2, 2.1	
2	Critically analyse, plan and synthesise, a range of Science learning and teaching activities and sequences for junior secondary students that involve a variety of pedagogical approaches and resources (including safe and ethical pedagogy and use of resources including ICT) appropriate to state and national curricula.	1.2, 2.2, 2.6, 3.1, 3.2, 3.3, 3.4, 4.4, 4.5	
3	Describe, design, and evaluate a unit of work involving a variety of teaching strategies that cater for individual differences in student learning (across a range of abilities) and integrate capabilities and priorities of state and/or national curriculum in Science Education.	1.5, 2.4, 2.5, 2.6, 3.3, 4.1, 5.3, 5.4	
4	Examine the relationships between assessment, feedback and reporting, learning task design, student engagement and knowledge and skills to be developed in Science, and apply to the requirements of curriculum documents.	2.3, 3.6, 5.1, 5.2	

<b>Assessment:</b>				
Assessment Summary		Word Count Equivalence	%	APST
1	Task 1: Evaluation of Teaching Resources	1350	30	1.2, 1.5, 2.1, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.6, 4.1, 4.4, 4.5, 5.1, 5.2, 5.3, 5.4
2	Task 2: Curriculum-based Unit Plan	2250	50	1.2, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.6, 4.1, 4.4, 4.5
3	Task 3: Reflective Journal	900	20	1.2, 2.4, 2.5, 2.6, 3.3, 4.1, 5.1, 5.2, 5.3, 5.4
Assessment Details (including Assessment Criteria)				
1	<p><b>Task 1: Evaluation of Teaching Resources</b>            Pre-service teachers will be assigned a topic for teaching in the Years 7-10 curriculum. The student can indicate the system they are addressing and why. In that topic they will perform an intensive resource collection to suit the topic. They will source 30 resources from a variety of quality locations inclusive of those developed by Government and Professional Associations. From these resources they will select five to perform a cognitive audit, and indicate the concepts learnt and how they are conveyed with the use of this resource. The precise contribution to student learning will cover awareness and understanding of an applicability for student learning styles, differentiation, technology applications, engagement, hands-on learning activities, innovation and creativity. For each activity pre-service teachers will indicate how they would use this in the classroom. A showcase of one of these activities will be prepared in a microteaching session. The show case will be marked with graduate standards in mind. For each of the 25 resources that were discounted, it is expected that the student will identify the weaknesses of each resource not selected.</p>			
2	<p><b>Task 2: Curriculum-based Unit Plan</b>            In the same topic as Task 1 the student will design a three week unit of work to be compiled and submitted from intensive class content, online modules that cover "Introduction", "Planning", "Curriculum" and "Assessment and Reporting". Not all of the topics need to be covered. Pre-service teachers will need to use teacher judgement as to the timing and sequence required. It is expected that the Task 1 resource collection will be thoughtfully used, but not exclusively used, to develop this Task.</p> <p><b>Assessment Criteria</b>            This unit of work is to include</p> <ol style="list-style-type: none"> <li>1. one overview plan for a unit (a unit at a glance is required),</li> <li>2. one detailed lesson plan,</li> <li>3. reference to one diagnostic,</li> <li>4. one formative and one summative assessment task,</li> <li>5. a clear orientation to selected curriculum (curriculum document, learning area, learning level), and</li> <li>6. an overarching justification and illustration of pedagogical and curricular considerations (incorporating evidence and philosophy based on ongoing Module-based fora discussions and readings).</li> </ol> <p>Formative written feedback and rubric assessment will be provided in response to each task.</p>			
3	<p><b>Task 3: Reflective Journal</b>            This reflection is to express, justify and support (with high-quality resources and evidence) your developing professional and pedagogical beliefs, in a manner and mode appropriate to your selected Method area. You will develop a concise professional statement that demonstrates an informed, coherent philosophy and pedagogical stance in your teaching method. This should show what matters to you and how you intend to teach this subject in schools.</p> <p>This reflection task will allow you to demonstrate critical consideration of ideas and issues explored through face-to-face and online activities, ongoing participation in the method subject, careful analysis of self as</p>			

teacher, and personal and professional reflection. In order to compile your ideas and response to this task, you should ensure that you engage in critical personal reflection regarding your developing professionalism and pedagogy. You should record reflective responses throughout this trimester, as this is your first opportunity to explore your selected Method areas within your pedagogical and curricular frame.

From the commencement of trimester 2, you are strongly encouraged to record:

- a) Reflective responses to face-to-face intensive classes;
- b) Reflective responses recorded throughout online modules; and
- c) Reflective professional statement completed upon conclusion of other assessments and online requirements.

Throughout the trimester and when developing your statement, you should critically reflect on:

- Literature and research in your subject area;
- Course materials you have considered in the online modules and intensive workshops;
- The portfolio of ideas and responses you developed during the modules in this subject; and
- Your professional experiences in schools.

This Reflection is just the beginning of an ongoing reflective journal that should provide evidence of your development as a critically reflective practitioner; this is a valuable tool as a pre-service teacher and will be useful as you collate a professional folio towards the end of your course. You will be required to undertake additional reading to develop and support your Reflection.

The finished product of your reflection may take different forms for each Method. It should include a digital component – whether in reference to the impact of digital technologies in your Method area, or the mode of delivery of your reflection. It might include a reflective journal that demonstrates how you have developed your knowledge and skills by participating in the various online and face-to-face activities in the modules and intensives. The mode of your expression and delivery will be further specified and explained during Intensive 2 and/or via LMS. Your Reflection should include Method-specific observations or reflections from your professional experience/s to date.

#### Assessment Criteria

The grading criteria for this task focus on the areas of:

1. Critical reflection on philosophy and pedagogy within the selected Method area;
2. Development of a professional statement;
3. Effective, scholarly, research-based expression.

Learning Resources	
Required Texts	
1	Venville, G. and Dawson, V. (2012). <i>The Art of Teaching Science For idle and Secondary School</i> (2 <sup>nd</sup> ed.) Allen and Unwin
Recommended Reading	
1	Junior Science Text books including but not exclusive to publishers such as: Jacaranda, Oxford, Nelson and Macmillan
2	Lecture produced notes: <a href="http://youtu.be/7Fql2aWJadM">http://youtu.be/7Fql2aWJadM</a> and <a href="http://youtu.be/B1BBEyKl1Yk">http://youtu.be/B1BBEyKl1Yk</a>
3	Science Awareness and Scientific Literacy – Leonie Rennie: <a href="https://lms.latrobe.edu.au/pluginfile.php/2428978/mod_book/chapter/115445/Rennie%282005%29.pdf">https://lms.latrobe.edu.au/pluginfile.php/2428978/mod_book/chapter/115445/Rennie%282005%29.pdf</a>
4	VCAA Scope and Sequence Chart: <a href="http://victoriancurriculum.vcaa.vic.edu.au/science/introduction/scope-and-sequence">http://victoriancurriculum.vcaa.vic.edu.au/science/introduction/scope-and-sequence</a>
5	VCAA F-10 Curriculum Link: <a href="http://victoriancurriculum.vcaa.vic.edu.au/science/introduction/rationale-and-aims">http://victoriancurriculum.vcaa.vic.edu.au/science/introduction/rationale-and-aims</a>

Learning Activities Overview:		
Week	Learning Topic	Learning Activities/Readings
1	Introduction, Extending Content Knowledge, General Resources	What is Science? History of Science. Resources for teaching Science Reading: Venville, G. and Dawson, V. (2012) Ch. 1 What is Science?
2	Science Curriculum: P-10	Introduction to Australian and Victorian curriculum P-10 (Science) <ul style="list-style-type: none"> <li>• Big ideas that underpin science curricula</li> <li>• Explore structure and content</li> </ul> Reading: Venville, G. and Dawson, V. (2012) Ch. 7 The Australian Science Curriculum
3	Science Curriculum: VCE	Introduction to the VCE study designs (Biology, Chemistry, Physics) and assessment documentation <ul style="list-style-type: none"> <li>• Big ideas that underpin science curricula</li> <li>• Explore structure and content</li> </ul> Reading: VCE Study Designs and Assessment Guides
4	Teaching and Learning in Science	Constructivism, conceptual change (epistemological, ontological, affective) Scientific literacy and representations Readings: Venville, G. and Dawson, V. (2012) Ch. 2 Constructivism and Sociocultural Views of Teaching and Learning Venville, G. and Dawson, V. (2012) Ch. 3 Conceptual Change Learning and Teaching
5	Planning	Planning in schools (long, medium and short-term) Backward design, Inquiry approach. Writing learning outcomes Lesson and unit planning, templates and the 5Es Reading: Venville, G. and Dawson, V. (2012) Ch. 5 Planning in Secondary Science
6	Inquiry and Investigations in Science	Techniques for finding students prior understandings Effective use of Inquiry and Investigations in the science classroom Reading: Venville, G. and Dawson, V. (2012) Ch. 6 Inquiry and Investigations in Science
7	Teaching and Learning Strategies in Science (including teaching safety)	Teaching and Learning Strategies in Science Classrooms. Tips and Tricks including the teaching of safety in laboratories Reading: Venville, G. and Dawson, V. (2012) Ch. 4 Teaching Strategies for Science Classrooms
8	Assessment and reporting in Science	Diagnostic, Formative and Summative Assessment (and of, as, and for) Assessment Moderation and practice assessment and moderation Reading: Venville, G. and Dawson, V. (2012) Ch. 8 Assessment of and for Learning in Science
9	ICT, Literacy and Numeracy in Science, and General Capabilities	ICT, Literacy and Numeracy in Science, and General Capabilities Reading: Venville, G. and Dawson, V. (2012) Ch. 11 ICT in the Science Classroom
10	Classroom Enrichment in Science	Excursions, incursions, taking students outdoors, questioning, personalising learning. Exploration of Resources Reading: Venville, G. and Dawson, V. (2012) Ch. 9 Student Engagement in Science Lessons & Ch. 10 Developing a 'Thinking' Science Curriculum
11	Equity, Diversity and Excellence in Science Curricula	Equity, Diversity and Excellence in Science Curricula. Teaching for Diversity Reading: Venville, G. and Dawson, V. (2012) Ch. 12 Equity and Excellence in the Science Curriculum
12	Evaluating Teaching, Understanding Practice and Safety Practices	Reflective Practice, Evaluating Teaching, and Safety Procedures and Practices in classroom laboratories Readings: Departmental Safety Procedure/Practices Documentation

<b>Assessment</b>	
<b>Assessment Task No.</b>	<b>Description of task:</b>
1	Evaluation of Teaching Resources
<b>APST</b>	<b>Description of how each Graduate Teacher Standards is Taught, Practiced and Assessed</b>
1.2, 2.1, 2.6, 3.4	<p>Taught – Academic content covered weeks 1-4, 6, 7, 9, 10 of the semester.</p> <p>Practiced – PSTs will encounter and have experience with a range of resources through weeks mentioned above in the semester. They will contribute to the development of resources banks in subject specific areas and identify where and what underpins quality teaching tools in science. Online modules will give guidance, but experience of practice will be housed in discovering resources available in recognised government developed tools and state and national curriculum documents which begins the direction of a planning for teaching approach.</p> <p>Assessed – Assessment Task 1</p>
<b>Assessment Task No</b>	<b>Description of task:</b>
2	Curriculum-based Unit Plan
<b>APST</b>	<b>Description of how each Graduate Teacher Standards is Taught, Practiced and Assessed</b>
1.2, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.6, 4.1, 4.4, 4.5	<p>Taught – Academic content covered in weeks 2, 3, 5 -12</p> <p>Practiced – PSTs will be initially introduced into the curriculum documents then in a sequence of weeks through online modules encounters and interact with the planning and theory required in developing well-structured, well- resourced and innovative lessons, sequences of lessons and unit plans that address the needs and provide feedback to increase learning for all students in a class. The resource collection for the first task scaffolds and provides feedback and feed-in to this assessment.</p> <p>Assessed – Assessment Task 2</p>
<b>Assessment Task No</b>	<b>Description of task:</b>
3	Reflective Journal
<b>APST</b>	<b>Description of how each Graduate Teacher Standards is Taught, Practiced and Assessed</b>
1.2, 2.4, 2.5, 2.6, 3.3, 4.1, 5.1, 5.2, 5.3, 5.4	<p>Taught – Academic content taught during weeks 1-12.</p> <p>Practiced –Experiences in the online modules are followed by interactive discussion spaces where sharing has occurs with regard to the practice and the theory of teaching in Science. PSTs then draw from what they have encountered and develop a stance of what it is to be a science teacher and how they will integrate what they have encountered. The practices and experiences provides the background for this task.</p> <p>Assessed – Assessment Task 3</p>