

Subject Title:	General Science Secondary Curriculum 2		
Subject Code:	EDU4GS2	Credit Points:	15
Teaching Period:	Trimester 3	Mode:	Blended
Prerequisite:		Level:	4
Subject Description:			
<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/Victorian context for Years 7-10 Science, 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>			
Intended Learning Outcomes (ILOs) & Australian Professional Standards for Teachers (APST)			
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	

Assessment:				
Assessment Summary		Word Count Equivalence	%	APST
1	Task 1: Curriculum-based Unit Plan	2250	50	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: Case Study of Issue/Teaching Resources (Produce and Publish)	1350	30	1.2, 2.1, 2.6, 3.4
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>Task 1: Curriculum-based Unit Plan</p> <p>Pre-service teachers will be assigned a different topic in the Years 7-10 curriculum. In the topic 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 topic needs to be covered. The topic will be particularly chosen to identify an enduring idea within the discipline. This will require depth of understanding elaborated upon in the teaching approach. The teaching approach will need to be defended. Pre-service teachers will use teacher judgement and reference the study design and teacher advice documentation to assist them with the timing and sequence required.</p> <p>It is expected that a comprehensive resource collection as in Task 1 EDU4SE1 will be compiled for this topic and used with insight. Skills and feedback from Task 2 EDU4SE1 provide the scaffolding for this task.</p> <p>Assessment Criteria</p> <p>This unit of work is to include</p> <ol style="list-style-type: none"> one overview plan for a unit (a unit at a glance is required), one innovative and detailed lesson plan, reference to one diagnostic, one formative and one summative assessment task*, a clear orientation to selected curriculum (curriculum document, learning area, learning level), and an overarching justification and illustration of pedagogical and curricular considerations. <p>*The summative task will require an associated assessment rubric, which will be designed as a teaching team.</p> <p>OR</p> <p>For those with a full General Science Method ONLY (those doing Biology, Chemistry or Physics with Science Method Task 2 (Issue) and Task 2i(Excursion))</p> <p>Pre-service teachers will develop an interdisciplinary science topic for Year 7-10 teaching. This should have a STE(A)M emphasis. It will present engagement in Science and view Science as a future subject in Year 11 and 12 students. There should be integration of Science disciplines. One lesson should be presented using the La Trobe University lesson plan. Aspects of diagnostic, formative and summative assessment should be presented within the topic and appropriately in the lesson plan. This can be develop using a contextual theme from an inspirational social and contemporary issue, a website of interested or a segment from a documentary. This must be referenced as the initial starting point and can be recognised as a unit that evolved from a "teachable moment". Awareness of the social, economic and political context should be integrated into the understandings developed in the unit.</p>			
2	<p>Task 2: Case Study of Issue/Teaching Resources (Produce and Publish)</p> <p>Pre-service teachers will select a topic of concern to them (an Issue in Science Education) to research and report upon in a scholarly manner. Suggestions will be given as a guide and previously published articles</p>			

	<p>provided as exemplars. This is a teacher as researcher approach where we look to current published literature and use reflective practice to apply the theory we encounter in our future practice. Pre-service teachers will write an article to be published in a Science Professional Association that addresses the issue selected. This sets both the audience and the expected mode of communication. To scaffold quality writing, pre-service teachers will design a narrated PowerPoint that outlines the key points as both a summary of the content, a means for sharing and an article plan. Pre-service teachers will peer-review each narrated Case Study PowerPoint and provide a brief response based on the readings and the Module materials.</p> <p>Assessment Criteria</p> <p>In the final article produced there should be:</p> <ol style="list-style-type: none"> 1. Evidence of appropriate current reading 2. The topic addressed with breadth and depth 3. Evidence of insight, originality and a clear stance taken for future science teaching pedagogy 4. Strong links to the content covered in tutorials and intensives 5. Calibre of writing, including the use of academic referencing for journal publication <p>Task 2i: Excursion Audit and Resource</p> <p>Pre-service teachers will be allocated an excursion location that can be used in science teaching (or select their own local science excursion location in consultation with their lecturer). For this excursion location each student will visit their centre/site and perform an audit of the site and its resources using a template audit document. Following this each student will, in consultation with the site staff identify particular resource needs, construct an innovative, new teachers' resource package that will be shared with their peers and the site for potential publication/use.</p> <p>Each student's audit and resource will be shared with their peers via LMS with a 5 minute introductory video to accompany the documentation.</p> <p>Formative written feedback and rubric assessment will be provided in response to each task.</p>
3	<p>Task 3: Reflective Journal</p> <p>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 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.</p> <p>From the commencement of trimester 2, you are strongly encouraged to record:</p> <ol style="list-style-type: none"> 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. <p>Throughout the trimester and when developing your statement, you should critically reflect on:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>

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) The Art of Teaching Science For idle and Secondary School (2 nd Ed.) Allen and Unwin
Recommended Reading	
1	Lecture produced notes: http://youtu.be/7FqI2aWJadM and http://youtu.be/B1BBEyKI1Yk
2	VCAA Scope and Sequence Chart: http://victoriancurriculum.vcaa.vic.edu.au/science/introduction/scope-and-sequence
3	VCAA F-10 Curriculum Link: http://victoriancurriculum.vcaa.vic.edu.au/science/introduction/rationale-and-aims
4	Science Awareness and Scientific Literacy – Leonie Rennie: https://lms.latrobe.edu.au/pluginfile.php/2428978/mod_book/chapter/115445/Rennie%282005%29.pdf
5	Junior Science Text books including but not exclusive to publishers such as: Jacaranda, Oxford, Nelson and Macmillan

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: F-10 (Extended)	Introduction to Australian and Victorian curriculum F-10 (Science) <ul style="list-style-type: none"> • Big ideas that underpin science curricula • Explore structure and content Reading: Venville, G. and Dawson, V. (2012) Ch. 7 The Australian Science Curriculum
3	Teaching and Learning and Strategies and Safety in Science (Extended)	Constructivism, conceptual change (epistemological, ontological, affective) Scientific literacy and representations Teaching and Learning Strategies in Science Classrooms. Tips and Tricks including the teaching of safety in laboratories Readings: Venville, G. and Dawson, V. (2012) Ch. 2 Constructivism and Sociocultural Views of Teaching and Learning; Ch. 3 Conceptual Change Learning and Teaching; Ch. 4 Teaching Strategies for Science Classrooms
4	Assessment and reporting in Science (Extended)	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
5	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
6	Equity, Diversity and Excellence in Science Curricula (Extended)	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
7	Curriculum Exploration: Physical Sciences	Concepts and Conceptual Development F-10, Common student alternative conceptions, specific teaching and learning strategies
8	Curriculum Exploration: Chemical Sciences	Concepts and Conceptual Development F-10, Common student alternative conceptions, specific teaching and learning strategies
9	Curriculum Exploration: Biological Sciences	Concepts and Conceptual Development F-10, Common student alternative conceptions, specific teaching and learning strategies
10	Curriculum Exploration: Earth and Space Sciences	Concepts and Conceptual Development F-10, Common student alternative conceptions, specific teaching and learning strategies
11	Curriculum Exploration: Science Inquiry Skills	Concepts and Conceptual Development F-10, specific teaching and learning strategies
12	Curriculum Exploration: Science as a Human Endeavour	Concepts and Conceptual Development F-10, specific teaching and learning strategies

Assessment	
Assessment Task No.	Description of task:
1	Curriculum-based Unit Plan
APST	Description of how each Graduate Teacher Standards is Taught, Practiced and Assessed
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 weeks 1-6 of the semester. Also recommended access into the appropriate module for the unit given in weeks 6-12.</p> <p>Practiced – PSTs will encounter at a more extended level of content compared to 4GS1 through the first 6 weeks of semester in the online modules, through activities and discussion spaces: safety, resources (inclusive of ICT), innovative teaching tips and practices, and assessment in the P-10 Curriculum. This allows for understanding and knowledge of a diverse student cohort expected skill development and the conjoined Big Ideas that are developed in the National Science Curriculum.</p> <p>Assessed – Assessment Task 1</p>
Assessment Task No	Description of task:
2	Case Study of Issue/Teaching Resources (Produce and Publish) OR Excursion Audit and Resource
APST	Description of how each Graduate Teacher Standards is Taught, Practiced and Assessed
1.2, 2.1, 2.6, 3.4	<p>Taught – Academic content covered weeks of the semester.</p> <p>Practiced – The scope of the National Science Curriculum and its embedded resources is interrogated by PSTs through investigation of all strands of the document. Encounters through online modules, readings, activities and discussions of science curriculum F-10 documents opens a vantage point. From this understanding standpoint critique and insight into issues related to science teaching are both discovered, investigated and capitalised upon, or alternatively, by viewing the site of an educational science provider a market gap can be identified in terms of teaching resources to better meet the needs of the F-10 curriculum in an off-site excursion for innovative and holistic learning and teaching. Both directions provide PSTs with a publishable piece for sharing with their PST cohort, and with innovation, externally, as a professional learning/development and dissemination opportunity.</p> <p>Assessed – Assessment Task 2</p>
Assessment Task No	Description of task:
3	Reflective Journal
APST	Description of how each Graduate Teacher Standards is Taught, Practiced and Assessed
1.2, 2.4, 2.5, 2.6, 3.3, 4.1, 5.1, 5.2, 5.3, 5.4	<p>Taught – Academic content covered weeks of the semester.</p> <p>Practiced – Given the encounters of online discussions, weekly module activities over the semester and the tasks and feedback PSTs have received they now present a re-cap of the subject and a coherent stance from their encounters of the subject in the context of teaching Science. The Big Picture key ideas of the national curriculum presented in weeks 6-12 present an experience of the links and opportunities for the teacher. The activities of interpretation in these modules set a basis for issues, understanding and skill building.</p> <p>Assessed – Assessment Task 3</p>