Unit Outline (Higher Education)

Institute / School:	Institute of Education, Arts & Community
Unit Title:	SCIENCE CONTENT AND PEDAGOGY 1
Unit ID:	EDMST6020
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	070301

Description of the Unit:

This is the first in a series of two units to help out-of-field and non-specialist science teachers develop knowledge and skills of the science curriculum to teach science in years 5-10. In this unit, students question the nature of the field of science and are introduced to the key scientific disciplines of earth and space sciences and biological sciences. Students explore key science concepts, including facts, laws, and theories. They examine how practical scientific inquiry skills can be used safely in the year 5-10 classroom. Students build skills in planning units of science that integrate science understandings and scientific skills to develop innovative and engaging science units for middle years learners. Employing a constructivist approach to teaching science, students consider the role of a universal science education and develop profiles of scientifically literate learners.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

Work Experience:

Not wholly work experience: Student is not undertaking work experience in industry or student is undertaking work experience in industry where learning and performance is directed by the provider.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory				✔		
Intermediate						
Advanced						

Learning Outcomes:

(On successful completion of the course the students are expected to be able to):

Knowledge:

K1. Recognise the nature of Science as a constantly developing field of knowledge and the processes of scientific thinking which supports this development.

K2. Explore ways of scientific knowing, including facts, laws, and theories.

K3. Outline reasons for a universal science education in the middle years of schooling.

K4. Explain key scientific understandings from biological sciences and earth and space sciences.

K5. Explore theories that underpin contemporary middle years science teaching, including constructivist theory, curriculum theories and research about middle years learners.

K6. Examine students' current levels of scientific literacies in years 5-10 scientific classrooms.

K7. Explore ethical and safe practices to teach biological and earth and space sciences.

Skills:

S1. Determine appropriate theoretical frameworks and employ them to develop resources for teaching middle years science

S2. Construct engaging units of science that teach biological and earth and spaces sciences to students in years 5-10.

S3. Identify and collate resources to teach science in the middle years.

S4. Present arguments that articulate the need for, and type of, contemporary science education in years 5-10.

S5. Embed teaching towards scientific literacy in the development of educational resources for middle years students.

S6. Evaluate year 5-10 students’ current levels of scientific literacy and make recommendations for future science teaching for individual students and cohorts.

S7. Construct safe and ethicl work practices to teach biological and earth and space sciences.

Application of knowledge and skills:

A1. Collect and analyse artefacts from a small group of students in years 5-10 and analyse the artefacts to determine the current level of scientific literacy students have.

A2. Make recomendations about teaching science to scientific learners from year 5-10 based on the artifact analysis.

A3. Assemble unit planners to teach biological or earth and space sciences to middle years science learners.

A4. Justify choices made in the development of teaching resources for middle years science.

Unit Content:

Topics may include:

- The nature of science.
- Teaching for scientific literacy in the middle years
- Constructivist science teaching and other relevant theories
- Biological and earth and space sciences
- Middle years science learners
- Ethical and safe practices for teaching science.

FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**ttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are be embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.*

FEDTASK attribute and descriptor		**Development and acquisition of FEDTASKS in the Unit**	
		Learning Outcomes (KSA)	**Assessment task (AT#)**
FEDTASK 1 Interpersonal	Students will demonstrate high-level skills to effectively communicate, interact and work with others both individually and in groups. Students will be required to display (in person and/or online) high-level skills in-person and/or online in: • Effective verbal and non-verbal communication via a range of synchronous and asynchronous methods • Active listening for meaning and influencing • High-level empathy for others • Negotiating and demonstrating extended conflict resolution skills • Working respectfully in cross-cultural and diverse teams	K3, S2, S4, A4.	AT2
FEDTASK 2 Leadership	Students will demonstrate the ability to apply leadership skills and behaviours Students will be required to display skills in: • Creating, contributing to, and enabling collegial environments • Showing self-awareness and the ability to self-reflect for personal growth • Inspiring and enabling others • Making informed and evidence-based decisions through consultation with others • Displaying initiative and ability to solve problems	K2, K6, S6, A1, A2.	AT1
FEDTASK 3 Critical Thinking and Creativity	Students will demonstrate an ability to work in complex and ambiguous environments, using their imagination to create new ideas. Students will be required to display skills in: • Reflecting critically on complex problems • Synthesising, evaluating ideas, concepts and information • Proposing alternative perspectives to refine ideas • Challenging conventional thinking to clarify concepts through deep inquiry • Proposing creative solutions in problem solving	K3, S2, S4, A4.	AT2

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 4 Digital Literacy	Students will demonstrate the ability to work proficiently across a range of tools, platforms and applications to achieve a range of tasks Students will be required to display high-level skills in: • Finding, accessing, collating, evaluating, managing, curating, organising and appropriately and securely sharing complex digital information at a high-level • Receiving and responding to messages in a range of digital media • Using digital tools appropriately to conduct research • Contributing proficiently to digital teams and working groups • Participating in and utilising digital learning opportunities	NA	NA
FEDTASK 5 Sustainable and Ethical Mindset	Students will demonstrate the ability to think ethically and sustainably. Students will be required to display (in person and/or online) high-level skills in-person and/or online in: • The responsible conduct of research • Making informed judgments that consider the impact of devising solutions in multiple global economic environmental and societal contexts • Demonstrating commitment to social responsibility as a professional and a citizen • Generating research solutions which are sustainable,ethical, socially responsible and/or sustainable • Extending lifelong, life-wide and life-deep learning to be open to diverse others • Demonstrate extended actions to foster sustainability in their professional and personal life.	K2, K6, S6, A1, A2.	AT1

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2, K3, K6, S3, S4, S5, S6, A1, A2.	Collect and analyse student assessment taks and other artefacts to develop a learner profile for a small group of students in years 5-10 to examine their current levels of scientific literacy. Make recommendations for the teaching of science to the profiled students.	Learner Profile	30-50%
K4, K5, K7, S1, S2, S3, S5, S7, A3, A4.	Development of a unit of work, including the curation and creation of appropriate resources, for a year 5-10 science that demonstrates knowledge of contemporary science education theories and an accompanying video justification and explanation of the curriculum document. Video explanation to include an exegesis of the underpinning theory that has informed the unit planner and an explanation of key scientific concepts from biological or earth and space sciences.	Curriculum Development and Justification	50 – 70%

Adopted Reference Style:

APA

Refer to the library website for more information

Fed Cite - referencing tool