Unit Outline (Higher Education)

Institute / School: Institute of Education, Arts & Community

Unit Title: SCIENCE EDUCATION

Unit ID: EDBED2012

Credit Points: 15.00

Prerequisite(s): Nil

Co-requisite(s): Nil

Exclusion(s): (EDBED2005 and EDBED2009 and EDBED2011)

ASCED: 070303

Description of the Unit:
This unit is designed to develop an understanding of the nature of science and technology and their relationship with society through an activity-based approach. Key scientific concepts will be explored. Design thinking and technologies to generate and produce solutions will be examined. Discussion and analysis of the teaching and learning activities will enable students to personally evaluate different approaches to teaching science and technology to cater for a range of learners in the classroom. The development of an enthusiasm for science and technology and the teaching of these is a major focus of this unit.

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

Work Experience:

No work experience

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						

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

Learning Outcomes:

Knowledge:

K1. Understand the nature of science, science learning and key scientific concepts.

K2. Engage with a range of concepts related to technology and design thinking to produce solutions

K3. Understand the relationship that exists between scientific knowledge, technological development, and social issues.

K4. Explore the roles of teachers and learners in a science and technology classroom.

Skills:

S1. Apply strategies to ensure safety issues associated with the teaching and learning of science and technology are embedded in lesson design.

S2. Utilise a range of approaches to teaching science and technology and link these with current learning theories.

S3. Incorporate a range of resources, including ICTs, that engage students in their learning in the science and technology classroom.

S4. Design effective teaching strategies for the science and technology curriculum to engage students and enhance their learning.

Application of knowledge and skills:

A1. Develop skills to communicate key scientific and design technology ideas.

A2. Apply knowledge of effective student learning and teaching strategies to organise content into an effective science and technology teaching sequence and to incorporate a range of resources.

A3. Implement curriculum, assessment and reporting knowledge to design learning sequences and lesson plans in science education.

A4. Work collaboratively with staff and student colleagues in developing effective teaching skills in the area of science and technology education.

Unit Content:

Topics will include

- Resources, content and teaching strategies to deliver effective and engaging science and technology curriculum.
- Research into how students learn and the implications for teaching science and technology.
- Current curriculum with a strong focus on the development of lessons and practical activities that establish challenging learning goals through effective planning, structuring and sequencing of lessons/learning programs that use a wide range of teaching strategies.
- Methods and skills that are crucial to scientific inquiry, designing and making products.
- Conceptual ideas and processes about embedding science and technology, into classroom learning, understanding science as a human endeavour and the differences in learning progressions in science and technology.
- Science in everyday life and strategies in using these links in curriculum development.
- Exploration of a range of resources, including ICTs, that engage students in their learning in the science and technology classroom

- Embedding literacy and numeracy strategies and ICTs to enhance teaching and learning in the science and technology curriculum.

Graduate Attributes

The Federation University Federation graduate attributes (GA) are entrenched in the Higher Education Graduate Attributes Policy (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni Courses. Graduate attribute attainment typically follows an incremental development process mapped through Course progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all attributes must be directly assessed in each Course**

Graduate attribute and descriptor		Development and acquisition of GAs in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	S4	AT2, AT3
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	S2	AT1
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	K4	AT2
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	S3, A1, A4	AT1, AT3
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	S4, A4	AT2, AT3

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2, K3 S2, S3, A1. APST 2.1, 2.2, 2.3, 2.5, 2.6, 3.3, 3.4.	Reflective writing, weekly questions and reviews of weekly classroom activities and lectures.	Portfolio	40-60%
K1, K2, K3, K4 S1, S2, S4, A1, A2, A3, A4. APST 2.1, 2.2, 2.3, 2.5, 2.6, 3.2, 3.3, 3.4 5.1	Develop sequential lesson plans, learning activities, resources including ICT and assessment incorporating links between science and technology and at least one other Learning Area. Prepare, present and reflect on a science and technology practical activity from one of the lessons in the sequence above.	Sequential lesson plans and Peer presentation	40-60%

Adopted Reference Style:

APA

Refer to the library website for more information

Fed Cite - referencing tool

Professional Standards / Competencies:

Australian Professional Standards for Teachers (AITSL) - Graduate Teacher: Initial

Attribute	Assessed	Level
Professional Knowledge		
2. Know the content and how to teach it		
2.1 Content and teaching strategies of the teaching area Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area.	Yes	Intermediate
2.2 Content selection and organisation Organise content into an effective learning and teaching sequence.	Yes	Intermediate
2.3 Curriculum, assessment and reporting Use curriculum, assessment and reporting knowledge to design learning sequences and lesson plans.	Yes	Intermediate
2.5 Literacy and numeracy strategies Know and understand literacy and numeracy teaching strategies and their application in teaching areas.	Yes	Intermediate
2.6 Information and Communication Technology (ICT) Implement teaching strategies for using ICT to expand curriculum learning opportunities for students.	Yes	Intermediate
Professional Practice		
3. Plan for and implement effective teaching and learning		
3.2 Plan, structure and sequence learning programs Plan lesson sequences using knowledge of student learning, content and effective teaching strategies.	Yes	Intermediate
3.3 Use teaching strategies Include a range of teaching strategies.	Yes	Intermediate
3.4 Select and use resources Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning.	No	Intermediate
5. Assess, provide feedback and report on student learning		
5.1 Assess student learning Demonstrate understanding of assessment strategies, including informal and formal, diagnostic, formative and summative approaches to assess student learning.	Yes	Intermediate