Course Outline (Higher Education)

Institute / School: Institute of Education, Arts & Community

Course Title: SCIENCE EDUCATION

Course 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 Course:
This course 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 course.

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

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Introductory						
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.

Course 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.

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 course, and all must be directly assessed in each program.*

FEDTASK attribute and descriptor		**Development and acquisition of FEDTASKS in the course**	
		Learning Outcomes (KSA)	**Assessment task (AT#)**
FEDTASK 1 Interpersonal	Students will demonstrate the ability to effectively communicate, interact and work with others both individually and in groups. Students will be required to display skills in-person and/or online in: • Using effective verbal and non-verbal communication • Listening for meaning and influencing via active listening • Showing empathy for others • Negotiating and demonstrating conflict resolution skills • Working respectfully in cross-cultural and diverse teams.	K4, S4, A4,	AT 1, AT2, AT3
FEDTASK 2 Leadership	Students will demonstrate the ability to apply professional skills and behaviours in leading others. Students will be required to display skills in: • Creating a collegial environment • Showing self -awareness and the ability to self-reflect • Inspiring and convincing others • Making informed decisions • Displaying initiative	K2, K3, K4, S1, S2, S3, S4, A2	AT 1, AT2, AT3
FEDTASK 3 Critical Thinking and Creativity	Students will demonstrate an ability to work in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: • Reflecting critically • Evaluating ideas, concepts and information • Considering alternative perspectives to refine ideas • Challenging conventional thinking to clarify concepts • Forming creative solutions in problem solving	K1, K2, K3, S4, A2, A3.	AT 1, AT2, AT3
FEDTASK 4 Digital Literacy	Students will demonstrate the ability to work fluently across a range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: • Finding, evaluating, managing, curating, organising and sharing digital information • Collating, managing, accessing and using digital data securely • Receiving and responding to messages in a range of digital media • Contributing actively to digital teams and working groups • Participating in and benefiting from digital learning opportunities	K2, S3, A1	AT 1, AT2, AT3

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the course	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 5 Sustainable and Ethical Mindset	Students will demonstrate the ability to consider and assess the consequences and impact of ideas and actions in enacting ethical and sustainable decisions. Students will be required to display skills in: • Making informed judgments that consider the impact of devising solutions in global economic environmental and societal contexts • Committing to social responsibility as a professional and a citizen • Evaluating ethical, socially responsible and/or sustainable challenges and generating and articulating responses • Embracing lifelong, life-wide and life-deep learning to be open to diverse others • Implementing required actions to foster sustainability in their professional and personal life.	K3, S4, A4	AT 1, 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