Course Outline (Higher Education)

Institute / School:	Institute of Education, Arts & Community
Course Title:	SCIENCE EDUCATION
Course ID:	ECCEL2012
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	(EDBED2012 and EEZED3721)
ASCED:	070101

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. Students complete 10 days in the education setting for 0-2 year olds. Students are required to complete the activities outlined in Professional Experience Assessment Report (Form A). The students will also document their professional learning in Professional Experience Pre Service Teacher Learning Log (Form B) supported by their assigned University Mentor.

Education Setting

- Bachelor of Education (Early Childhood and Primary): **Primary – Years 3-6**
- Bachelor of Education (Joint Degrees): **Secondary – Minor**
- Bachelor of Health and Physical Education: **Secondary - Minor**
- Bachelor of Secondary Education: **Secondary - Minor**
- Bachelor of Secondary Education (Health and Physical Education Teaching): **Secondary - Minor**

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

Work Experience:

Wholly by work experience with Charge: Student is undertaking work experience in industry where learning and performance is not directed by the provider, but support is received from the provider.

Does Recognition of Prior Learning apply to this course? No

Placement Component: Yes

Supplementary Assessment: No

Supplementary assessment is not available to students who gain a fail in this course.

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.

K5. Inquire into their own and others' teaching to connect theoretical learning with the practice of teaching.

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.

S5. Reflect on, document and demonstrate appropriate professional standards in an authentic placement setting

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.

A5. Successfully complete 10 days placement as demonstrated through documenting personal learning tasks relevant to the placement setting.

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.
- This course contains a professional experience placement in which some learning and assessment takes place in that setting.

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, K5, S4, S5, A4, A5	AT 1, AT2, AT3

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the course	
		Learning Outcomes (KSA)	Assessment task (AT#)
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, K5, 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,K5, 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 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, S5, 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%

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
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 & Peer presentation	40% - 60%
K5, S5, A5	Completion of 10 days placement in the education setting specified. Complete Professional Experience Assessment Report (Form A) in collaboration with mentor teacher. Establish, reflect and evaluate learning goals and professional learning against the Australian Professional Standards for Teachers in the Pre-Service Teacher Learning Log (Form B)	Hurdle	S/U

Alignment to the Minimum Co-Operative Standards (MiCS)

The Minimum Co-Operative Standards (MiCS) are an integral part of the Co-Operative University Model. Seven criteria inform the MiCS alignment at a program level. Although courses must undertake MiCS mapping, there is NO expectation that courses will meet all seven criteria. The criteria are as follows:

1. Co-design with industry and students
2. Co-develop with industry and students
3. Co-deliver with industry
4. FedTASK alignment
5. Workplace learning and career preparation
6. Authentic assessment
7. Industry-link/Industry facing experience

MiCS program level reporting highlights how each program embraces the principals and practices associated with the Co-Operative Model. Evidence of program alignment with the MiCS, can be captured in the Program Modification Form.

MICS Mapping has been undertaken for this course No

Date:

Adopted Reference Style:

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		
1. Know students and how they learn		
1.1 Physical, social and intellectual development and characteristics of students Demonstrate knowledge and understanding of physical, social and intellectual development and characteristics of students and how these may affect learning.	Yes	Advanced
1.2 Understand how students learn Demonstrate knowledge and understanding of research into how students learn and the implications for teaching.	Yes	Advanced
1.3 Students with diverse linguistic, cultural, religious and socioeconomic backgrounds Demonstrate knowledge of teaching strategies that are responsive to the learning strengths and needs of students from diverse linguistic, cultural, religious and socioeconomic backgrounds.	Yes	Advanced
1.4 Strategies for teaching Aboriginal and Torres Strait Islander students Demonstrate broad knowledge and understanding of the impact of culture, cultural identity and linguistic background on the education of students from Aboriginal and Torres Strait Islander backgrounds.	Yes	Advanced
1.5 Differentiate teaching to meet the specific learning needs of students across the full range of abilities Demonstrate knowledge and understanding of strategies for differentiating teaching to meet the specific learning needs of students across the full range of abilities.	Yes	Advanced
1.6 Strategies to support full participation of students with disability Demonstrate broad knowledge and understanding of legislative requirements and teaching strategies that support participation and learning of students with disability	Yes	Advanced
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	Advanced
2.2 Content selection and organisation Organise content into an effective learning and teaching sequence.	Yes	Advanced

2.3 Curriculum, assessment and reporting Use curriculum, assessment and reporting knowledge to design learning sequences and lesson plans.	Yes	Advanced
2.4 Understand and respect Aboriginal and Torres Strait Islander people to promote reconciliation between Indigenous and non-Indigenous Australians Demonstrate broad knowledge of, understanding of and respect for Aboriginal and Torres Strait Islander histories, cultures and languages.	Yes	Advanced
2.5 Literacy and numeracy strategies Know and understand literacy and numeracy teaching strategies and their application in teaching areas.	Yes	Advanced
2.6 Information and Communication Technology (ICT) Implement teaching strategies for using ICT to expand curriculum learning opportunities for students.	Yes	Advanced

Professional Practice

3. Plan for and implement effective teaching and learning

3.1 Establish challenging learning goals Set learning goals that provide achievable challenges for students of varying abilities and characteristics.	Yes	Advanced
3.2 Plan, structure and sequence learning programs Plan lesson sequences using knowledge of student learning, content and effective teaching strategies.	Yes	Advanced
3.3 Use teaching strategies Include a range of teaching strategies.	Yes	Advanced
3.4 Select and use resources Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning.	Yes	Advanced
3.5 Use effective classroom communication Demonstrate a range of verbal and non-verbal communication strategies to support student engagement.	Yes	Advanced
3.6 Evaluate and improve teaching programs Demonstrate broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning.	Yes	Advanced
3.7 Engage parents/ carers in the educative process Describe a broad range of strategies for involving parents/carers in the educative process.	Yes	Advanced

4. Create and maintain supportive and safe learning environments

4.1 Support student participation Identify strategies to support inclusive student participation and engagement in classroom activities.	Yes	Advanced
4.2 Manage classroom activities Demonstrate the capacity to organise classroom activities and provide clear directions.	Yes	Advanced
4.3 Manage challenging behaviour Demonstrate knowledge of practical approaches to manage challenging behaviour.	Yes	Advanced
4.4 Maintain student safety Describe strategies that support students' wellbeing and safety working within school and/or system, curriculum and legislative requirements.	Yes	Advanced
4.5 Use ICT safely, responsibly and ethically Demonstrate an understanding of the relevant issues and the strategies available to support the safe, responsible and ethical use of ICT in learning and teaching.	Yes	Advanced
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	Advanced
5.2 Provide feedback to students on their learning Demonstrate an understanding of the purpose of providing timely and appropriate feedback to students about their learning.	Yes	Advanced
5.3 Make consistent and comparable judgements Demonstrate understanding of assessment moderation and its application to support consistent and comparable judgements of student learning.	Yes	Advanced
5.4 Interpret student data Demonstrate the capacity to interpret student assessment data to evaluate student learning and modify teaching practice.	Yes	Advanced
5.5 Report on student achievement Demonstrate understanding of a range of strategies for reporting to students and parents/carers and the purpose of keeping accurate and reliable records of student achievement.	Yes	Advanced
Professional Engagement		
6. Engage in professional learning		
6.1 Identify and plan professional learning needs Demonstrate an understanding of the role of the Australian Professional Standards for Teachers in identifying professional learning needs.	Yes	Advanced

6.2 Engage in professional learning and improve practice Understand the relevant and appropriate sources of professional learning for teachers.	Yes	Advanced
6.3 Engage with colleagues and improve practice Seek and apply constructive feedback from supervisors and teachers to improve teaching practices.	Yes	Advanced
6.4 Apply professional learning and improve student learning Demonstrate an understanding of the rationale for continued professional learning and the implications for improved student learning.	Yes	Advanced
7. Engage professionally with colleagues, parents/carers and the community		
7.1 Meet professional ethics and responsibilities Understand and apply the key principles described in codes of ethics and conduct for the teaching profession.	Yes	Advanced
7.2 Comply with legislative, administrative and organisational requirements Understand the relevant legislative, administrative and organisational policies and processes required for teachers according to school stage.	Yes	Advanced
7.3 Engage with the parents/carers Understand strategies for working effectively, sensitively and confidentially with parents/carers.	Yes	Advanced
7.4 Engage with professional teaching networks and broader communities Understand the role of external professionals and community representatives in broadening teachers' professional knowledge and practice.	Yes	Advanced