USC

Course Outline

Code: EDU749
Title: Teaching Junior Secondary Science 1

School: Education
Teaching Session: Semester 1
Year: 2020
Course Coordinator: Dr Tim Strohfeldt Email: tstrohfe@usc.edu.au
Course Moderator: Dr Kenneth Young Email: kyoung@usc.edu.au

Please go to the USC website for up to date information on the teaching sessions and campuses where this course is usually offered.

1. What is this course about?

1.1 Description

This course builds capacity to design and discern effective pedagogy within Science for Years 7 -10. You organise and plan lessons using the Australian Curriculum for Science, apply your knowledge, understanding and skills to interpret, evaluate and adapt learning, in order to engage Junior Secondary students. You will develop deep knowledge for integrating general capabilities and cross-curriculum priorities including Aboriginal and Torres Strait Islander perspectives into learning activities and critically reflect on your developing teaching practice.

1.2 Field trips, WIL placements or activities required by professional accreditation

Activity	Details
Course Assessment Tasks	All assessments are required to be successfully completed for professional accreditation

1.2 Course topics

- Science 'Big Ideas' and the nature of science and scientific literacy
- The Australian Curriculum: Science (ACS); Science Understanding, Science Inquiry Skills and Science as a Human Endeavour
- Science pedagogies for Years 7-10
- Representations, ICT, literacy and numeracy in science education
- Design of practical experiments and active learning activities
- Assessment, feedback and reporting in Science
- Strategies for differentiating teaching to include and engage the diversity of students

2. What level is this course?

700 level Specialised - Demonstrating a specialised body of knowledge and set of skills for professional practice or further learning. Advanced application of knowledge and skills in unfamiliar contexts

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

Specific Learning Outcomes On successful completion of this course you should be able to:	**Assessment Tasks** You will be assessed on the learning outcome in task/s:	**Graduate Qualities or Professional Standards mapping** Completing these tasks successfully will contribute to you becoming:
Apply a deep knowledge of the Australian Curriculum: Science and pedagogical content knowledge to develop science curriculum materials that provide intellectual quality, significance and quality learning environments.	2.Creating a Lesson Plan 3. Lesson Plan Evaluation	Empowered. Knowledgeable.
Apply a deep knowledge of scientific ideas and laboratory safety procedures to design classroom activities in Science.	1. Planning and Running a Science Classroom Activity 2: Creating a Lesson Plan	Empowered. Knowledgeable.
Apply a deep knowledge of diverse student learning needs, and a variety of pedagogical strategies including formative assessment, integration of ICT, literacy and/or numeracy in learning activities and assessment	1. Planning and Running a Science Classroom Activity 2: Creating a Lesson Plan 3. Lesson Plan Evaluation	Empowered. Knowledgeable.
Employ effective language, structure and text to communicate curriculum strategies and ideas.	1. Planning and Running a Science Classroom Activity 2: Creating a Lesson Plan 3. Lesson Plan Evaluation	Empowered. Knowledgeable.

Students may attend combined lectures with ED315, AE304 and SE303 undergraduate students. These parallel course deliveries are designed to give students access to expert lecturers. However, postgraduate courses may have additional or separate assessment tasks with appropriate criteria that acknowledge the different expectations, learning outcomes, prior knowledge and life experience of a student undertaking an AQF Level 9 program.

5. Am I eligible to enrol in this course?

Refer to the USC Glossary of terms for definitions of "pre-requisites, co-requisites and anti-requisites".

5.1 Enrolment restrictions

Must be enrolled in ED706 Master of Teaching (Secondary) and a Science Teaching area.

5.2 Pre-requisites

Nil

5.3 Co-requisites

Nil

5.4 Anti-requisites

Nil

5.5 Specific assumed prior knowledge and skills (where applicable)

Nil

6. How am I going to be assessed?

6.1 Grading scale

Standard – High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL)

6.2 Details of early feedback on progress

Task 1 is a group task involving planning and running a science activity suitable for junior secondary students. Your tutor will give you feedback on your one-page activity plan (due Week 3), and your tutor and peers will give you further feedback when you run the activity with your tutorial group (in Week 3, 4 or 5).

6.3 Assessment tasks

Task No.	Assessment Product	Individual or Group	Weighting %	What is the duration / length?	When should I submit?	Where should I submit it?
1	Oral, and Written Piece	Group	20%	1-page activity plan (individual) plus a 20 min presentation (group)	Activity Plan: Week 3 Presentations: Weeks 3 to 5	In Class
2	Plan	Individual	40%	1000 words	Week 7, Friday 5pm	Online Assignment Submission
3	Essay	Individual	40%	1500-1800 words	Week 10, Friday	Online Assignment Submission
			100%			

Assessment Task 1: Planning and Running a Science Classroom Activity

Goal:	The goal of this task is to demonstrate your ability to plan and deliver constructive, engaging and inclusive science activities.
Product:	Oral and Written Piece
Format:	In groups of 2 or 3, you will plan, explain and run an activity designed to help junior secondary students deepen their understanding of a science concept. Your presentation activity and written activity plan will include: • Identification of links between your activity and a science concept. • Identification of links between your activity and the Australian Curriculum: Science • Demonstrated teaching strategies that support engagement, inclusivity and classroom management in Years 7-9 science. • Demonstration of organisational and communication skills used to plan, present and run a science classroom activity
Criteria:	1. Application of deep knowledge of scientific ideas, practices and pedagogy to design classroom activities 2. Application of deep knowledge to cater to diverse student learning needs using a variety of pedagogical strategies 3. Employing effective language, structure and text to communicate curriculum strategies and ideas

Generic skill assessed	**Skill assessment level**
Collaboration	Specialised
Communication	Specialised

Assessment Task 2: Creating a Lesson Plan

Goal:	The goal of this task is to integrate teaching and learning activities as science lessons
Product:	Plan
Format:	You will use a provided template to design a lesson plan (1000 words) that integrates a science demonstration or experiment in a 70 minute lesson within a lesson sequence. You will use ICT at some stage of your lesson. You will: • apply principles of constructive alignment to develop and integrate lesson goals, learning activities and assessment strategies into a lesson plan • design a constructive learning sequence with strategies (eg. hands-on science, ICT, literacy, numeracy) to support inclusive student participation and engagement in classroom activities. • use knowledge of student learning, science content and effective teaching strategies to situate your lesson in a lesson sequence • plan for classroom management • apply organisational and communication skills
Criteria:	1. Application of the Australian Curriculum: Science and pedagogical content knowledge to develop science curriculum materials 2. Application of deep knowledge and referring to formative data to cater to diverse student learning needs using a variety of pedagogical strategies 3. Application of scientific ideas and laboratory safety procedures to classroom activities in Science 4. Employing effective language, structure and text to communicate curriculum strategies and ideas

Generic skill assessed	**Skill assessment level**
Problem solving	Specialised
Communication	Specialised

Assessment Task 3: Lesson Plan Evaluation

Goal:	The goal of this task is to apply education theory and a pedagogical framework to evaluate and develop a science lesson.
Product:	Essay
Format:	Your essay will evaluate your Task 2 lesson plan with reference to the Australian Curriculum: Science (ACS), the Quality Teaching (QT) Framework, and current well-informed education literature to demonstrate: • a working knowledge of Australian Curriculum: Science General Capabilities (ICT, literacy and numeracy) applied to teaching and learning activities • application of the QT pedagogical model and strategies that underpin quality science learning and teaching • application of formative assessment strategies to evaluate learning outcomes
Criteria:	1. Deep knowledge of the Australian Curriculum: Science and pedagogical content knowledge to evaluate a science lesson plan for intellectual quality, significance and quality learning environment. 2. Use of formative assessment data to cater to diverse student learning needs using a variety of pedagogical strategies 3. Employing effective language, structure and text to communicate curriculum strategies and ideas

Generic skill assessed	**Skill assessment level**
Applying technologies	Specialised
Communication	Specialised

7. Directed study hours

The directed study hours listed here are a portion of the workload for this course. A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Directed study hours may vary by location. Student workload is calculated at 12.5 learning hours per one unit.

Location:	Directed study hours for location:
USC Sunshine Coast	150

7.1 Course Content

Teaching Week / Module	What key concepts/content will I learn?	What activities will I engage in to learn the concepts/content?	
		Directed Study Activities	Independent Study Activities
Module 1 Weeks 1-3	Science for what?	• The Nature of Science • Thinking with Science Big Ideas • Deepening scientific knowledge and understanding • Misconceptions and alternative conceptions • How people construct scientific knowledge and understanding • The Australian Curriculum: Science (ACS) • Curriculum Alignment 1: Curriculum Objectives	The Art of Teaching Science, Chapters 1, 2, 3 & 7 Australian Curriculum: Science Blackboard
Module 2 Weeks 4-7	The Art and Science of Teaching Science	• STEM education, Scientific Literacy and Vocational Science • Curriculum Alignment 2: Lesson Goals and pedagogical decisions • Science Pedagogies • Assessment for Learning • *The Quality Teaching Framework*	The Art of Teaching Science, Chapters 4, 5, 6 & 8 Blackboard
Module 3 Weeks 8-10	Science Education Imperatives	• ACS General Capabilities: Literacy, Numeracy, ICT, Critical and Creative Thinking, Personal and Social Capacity, Ethical Understanding, Intercultural Understanding • ACS Curriculum Priorities: Aboriginal and Torres Strait Islander Histories and Cultures, Asia and Australia's Engagement with Asia, Sustainability	The Art of Teaching Science, Chapter 7 Australian Curriculum: Science Blackboard

Please note that the course activities may be subject to variation.

8. What resources do I need to undertake this course?

Please note that course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Blackboard site. Please log in as soon as possible.

8.1 Prescribed text(s)

Please note that you need to have regular access to the resource(s) listed below as they are required:

Author	Year	Title	Publisher
Venville, G., Dawson, V. & Donovan, J.	2019	The Art of Teaching Science: A comprehensive guide to the teaching of secondary school science, 3rd Edition.	Allen & Unwin

8.2 Required and recommended readings

Lists of required and recommended readings may be found for this course on its Blackboard site. These materials/readings will assist you in preparing for tutorials and assignments, and will provide further information regarding particular aspects of your course.

8.3 Specific requirements

Nil

9. Risk management

Health and safety risks for this course have been assessed as low.

It is your responsibility as a student to review course material, search online, discuss with lecturers and peers, and understand the health and safety risks associated with your specific course of study. It is also your responsibility to familiarise yourself with the University's general health and safety principles by reviewing the online Health Safety and Wellbeing training module for students, and following the instructions of the University staff.

10. What administrative information is relevant to this course?

10.1 Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Blackboard, are electronically checked through SafeAssign. This software allows for text comparisons to be made between your submitted assessment item and all other work that SafeAssign has access to.

10.2 Assessment: Additional requirements

Eligibility for Supplementary Assessment

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:

a) The final mark is in the percentage range 47% to 49.4%
b) The course is graded using the Standard Grading scale
c) You have not failed an assessment task in the course due to academic misconduct

10.3 Assessment: Submission penalties

Late submission of assessment tasks will be penalised at the following maximum rate:

- 5% (of the assessment task's identified value) per day for the first two days from the date identified as the due date for the assessment task.
- 10% (of the assessment task's identified value) for the third day
- 20% (of the assessment task's identified value) for the fourth day and subsequent days up to and including seven days from the date identified as the due date for the assessment task.
- A result of zero is awarded for an assessment task submitted after seven days from the date identified as the due date for the assessment task.

Weekdays and weekends are included in the calculation of days late.

To request an extension, you must contact your Course Coordinator and supply the required documentation to negotiate an outcome.

10.4 Study help

In the first instance, you should contact your tutor, then the Course Coordinator. Additional assistance is provided to all students through Academic Skills Advisers. To book an appointment or find a drop-in session go to Student Hub.

Contact Student Central for further assistance: +61 7 5430 2890 or studentcentral@usc.edu.au

10.5 Wellbeing Services

Student Wellbeing Support Staff are available to assist on a wide range of personal, academic, social and psychological matters to foster positive mental health and wellbeing for your success. Student Wellbeing is comprised of professionally qualified staff in counselling, health and disability Services.

Ability Advisers ensure equal access to all aspects of university life. If your studies are affected by a disability, mental health issue, learning disorder, injury or illness, or you are a primary carer for someone with a disability, AccessAbility Services can provide assistance, advocacy and reasonable academic adjustments.

To book an appointment with either service go to Student Hub, email studentwellbeing@usc.edu.au or accessability@usc.edu.au or call 07 5430 1226

10.6 Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Administration of Central Examinations
- Deferred Examinations
- Student Academic Misconduct
- Students with a Disability

Visit the USC website:
http://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

10.7 General Enquiries

In person:

- **USC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **USC Moreton Bay** – Service Centre, Ground Floor, Foundation Building, Gympie Road, Petrie
- **USC SouthBank** - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- **USC Gympie** - Student Central, 71 Cartwright Road, Gympie
- **USC Fraser Coast -** Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay
- **USC Caboolture -** Student Central, Level 1 Building J, Cnr Manley and Tallon Street, Caboolture

Tel: +61 7 5430 2890

Email: studentcentral@usc.edu.au

10.8 School Specific Information

The assessment tasks in this course support pre-service teachers to explicitly demonstrate the following Australian Professional Standards for Teachers (Graduate):

Assessment Task	Australian Professional Standards for Teachers (Graduate)
Task 1: Planning and Running a Science Classroom Activity	2.1 Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area. 2.2 Organise content into an effective learning and teaching sequence. 3.3 Include a range of teaching strategies. 3.5 Demonstrate a range of verbal and non-verbal communication strategies to support student engagement 4.1 Identify strategies to support inclusive student participation and engagement in classroom activities. 4.2 Demonstrate the capacity to organise classroom activities and provide clear directions. 4.3 Demonstrate knowledge of practical approaches to manage challenging behaviour.
Task 2: Creating a Lesson Plan	1.1 Demonstrate knowledge and understanding of physical, social and intellectual development and characteristics of students and how these may affect learning. 2.1 Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area. 2.2 Organise content into an effective learning and teaching sequence. 2.3 Use curriculum, assessment and reporting knowledge to design learning sequences and lesson plans. 2.4 Demonstrate broad knowledge of, understanding of and respect for Aboriginal and Torres Strait Islander histories, cultures and languages. 2.5 Know and understand literacy and numeracy teaching strategies and their application in teaching areas. 2.6 Implement teaching strategies for using ICT to expand curriculum learning opportunities for students. 3.1 Set learning goals that provide achievable challenges for students of varying abilities and characteristics. 3.2 Plan lesson sequences using knowledge of student learning, content and effective teaching strategies. 3.3 Include a range of teaching strategies. 3.4 Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning. 3.5 Demonstrate a range of verbal and non-verbal communication strategies to support student engagement. 3.6 Demonstrate broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning.

	4.1 Identify strategies to support inclusive student participation and engagement in classroom activities. 4.2 Demonstrate the capacity to organise classroom activities and provide clear directions. 4.3 Demonstrate knowledge of practical approaches to manage challenging behaviour. 5.1 Demonstrate understanding of assessment strategies, including informal and formal, diagnostic, formative and summative approaches to assess student learning.
Task 3: Lesson Plan Evaluation	2.1 Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area. 2.4 Demonstrate broad knowledge of, understanding of and respect for Aboriginal and Torres Strait Islander histories, cultures and languages. 2.5 Know and understand literacy and numeracy teaching strategies and their application in teaching areas. 2.6 Implement teaching strategies for using ICT to expand curriculum learning opportunities for students. 3.3 Include a range of teaching strategies. 3.4 Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning. 3.6 Demonstrate broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning. 4.5 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. 5.2 Demonstrate an understanding of the purpose of providing timely and appropriate feedback to students about their learning. 5.3 Demonstrate understanding of assessment moderation and its application to support consistent and comparable judgements of student learning. 5.4 Demonstrate the capacity to interpret student assessment data to evaluate student learning and modify teaching practice. 5.5 Demonstrate understanding of a range of strategies for reporting to students and parents/carers

Overview of the Master of Teaching (Secondary) Program

Phase 1 - Orientation to the profession:

EDU764 Quality Teaching and Learning
EDU765 Professional Experience: Orientation to the Profession
First two curriculum courses

Phase 2 - Enhancing professional knowledge and skills:

EDU712 Diversity and Inclusion
EDU713 Individual Learner Needs
EDU715 Literacy and Numeracy across the Curriculum
EDU716 Aboriginal and Torres Strait Islander Perspectives in Teaching and Learning
EDU766 Assessing Learning
EDU714 Professional Experience: Managing Learning Environments
Second two curriculum courses

Phase 3 - Synthesis of professional knowledge in practice and research:

EDU717 Using Data for Learning
EDU718 Teacher as Researcher
EDU719 Teacher as Global Practitioner
EDU720 Professional Experience: The Professional Teacher