



COURSE OUTLINE

EDU749

Teaching Junior Secondary Science 1

Course Coordinator: Timothy Strohfeldt (tstrohfe@usc.edu.au) **School:** School of Education and Tertiary Access

2021 | Semester 1

USC Sunshine Coast

ON CAMPUS

Most of your course is on campus but you may be able to do some components of this course online.

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. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
ON CAMPUS			
Lecture – 2 hr per week online recorded lecture and associated learning activities	2hrs	Week 1	10 times
Tutorial/Workshop – 2hr per week on-campus tutorial workshops	2hrs	Week 1	10 times

1.3. 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
- Differentiating teaching to meet academic diversity
- Assessment, feedback and reporting in science

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?

COURSE LEARNING OUTCOMES	GRADUATE QUALITIES MAPPING	PROFESSIONAL STANDARD MAPPING
On successful completion of this course, you should be able to...	Completing these tasks successfully will contribute to you becoming...	Australian Institute for Teaching and School Leadership
<p>1 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.</p>	<p>Knowledgeable Empowered</p>	<p>2 - Know the content and how to teach it 3 - Plan for and implement effective teaching and learning 4 - Create and maintain supportive and safe learning environments 5 - Assess, provide feedback and report on student learning</p>
<p>2 Apply a deep knowledge of scientific ideas and laboratory safety procedures to design classroom activities in Science.</p>	<p>Knowledgeable Empowered</p>	<p>2 - Know the content and how to teach it 3 - Plan for and implement effective teaching and learning 4 - Create and maintain supportive and safe learning environments 5 - Assess, provide feedback and report on student learning</p>
<p>3 Apply a deep knowledge of diverse student learning needs, and a variety of pedagogical strategies including formative assessment, integration of ICT, literacy and numeracy in learning activities and assessment</p>	<p>Knowledgeable Empowered</p>	<p>2 - Know the content and how to teach it 3 - Plan for and implement effective teaching and learning 4 - Create and maintain supportive and safe learning environments 5 - Assess, provide feedback and report on student learning</p>

COURSE LEARNING OUTCOMES	GRADUATE QUALITIES MAPPING	PROFESSIONAL STANDARD MAPPING
On successful completion of this course, you should be able to...	Completing these tasks successfully will contribute to you becoming...	Australian Institute for Teaching and School Leadership
4 Employ effective language, structure and text to communicate curriculum strategies and ideas.	Knowledgeable Empowered	3 - Plan for and implement effective teaching and learning

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. Pre-requisites

Enrolled in Program ED706 and a Science Teaching area

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

Not applicable

5.4. Specific assumed prior knowledge and skills (where applicable)

Not applicable

6. How am I going to be assessed?

6.1. Grading Scale

Standard Grading (GRD)

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

DELIVERY MODE	TASK NO.	ASSESSMENT PRODUCT	INDIVIDUAL OR GROUP	WEIGHTING %	WHAT IS THE DURATION / LENGTH?	WHEN SHOULD I SUBMIT?	WHERE SHOULD I SUBMIT IT?
All	1	Oral and Written Piece	Individual and Group	20%	Part A: 500 word activity plan (individual). Part B: 20 minute presentation (group).	Refer to Format	In Class
All	2	Plan	Individual	30%	1000 words	Week 7	Online Assignment Submission with plagiarism check

DELIVERY MODE	TASK NO.	ASSESSMENT PRODUCT	INDIVIDUAL OR GROUP	WEIGHTING %	WHAT IS THE DURATION / LENGTH?	WHEN SHOULD I SUBMIT?	WHERE SHOULD I SUBMIT IT?
All	3	Essay	Individual	50%	1800 words	Week 10	Online Assignment Submission

All - 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:	<p>In a small group 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:</p> <ul style="list-style-type: none"> 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. <p>Submission: Activity Plan: Week 3. Presentations: Weeks 3 to 5.</p>													
CRITERIA:	<table border="1"> <thead> <tr> <th>No.</th> <th></th> <th>Learning Outcome assessed</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Application of deep knowledge of scientific ideas, practices and pedagogy to design classroom activities</td> <td>2</td> </tr> <tr> <td>2</td> <td>Application of deep knowledge to cater to diverse student learning needs using a variety of pedagogical strategies</td> <td>3</td> </tr> <tr> <td>3</td> <td>Employing effective language, structure and text to communicate curriculum strategies and ideas</td> <td>4</td> </tr> </tbody> </table>	No.		Learning Outcome assessed	1	Application of deep knowledge of scientific ideas, practices and pedagogy to design classroom activities	2	2	Application of deep knowledge to cater to diverse student learning needs using a variety of pedagogical strategies	3	3	Employing effective language, structure and text to communicate curriculum strategies and ideas	4	
No.		Learning Outcome assessed												
1	Application of deep knowledge of scientific ideas, practices and pedagogy to design classroom activities	2												
2	Application of deep knowledge to cater to diverse student learning needs using a variety of pedagogical strategies	3												
3	Employing effective language, structure and text to communicate curriculum strategies and ideas	4												

All - Assessment Task 2: Creating a Lesson Plan

GOAL:	The goal of this task is to plan a science lesson and situate it within an ACS lesson sequence.
PRODUCT:	Plan
FORMAT:	<p>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 cannot repeat any of the same activities you used in your Task 1, and you must use technology-enabled learning at some stage of your lesson. You will:</p> <ul style="list-style-type: none"> • 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:	No.	Learning Outcome assessed
	1	Application of the Australian Curriculum: Science and pedagogical content knowledge to develop science curriculum materials 1
	2	Application of deep knowledge and referring to formative data to cater to diverse student learning needs using a variety of pedagogical strategies 3
	3	Application of scientific ideas and laboratory safety procedures to classroom activities in Science 2
	4	Employing effective language, structure and text to communicate curriculum strategies and ideas 4

All - Assessment Task 3: Lesson Plan Evaluation

GOAL:	The goal of this task is to apply education theory and a given pedagogical framework to evaluate and develop your Task 2 science lesson.	
PRODUCT:	Essay	
FORMAT:	<p>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:</p> <ul style="list-style-type: none"> • 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:	No.	Learning Outcome assessed
	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. 1
	2	Use of formative assessment data to cater to diverse student learning needs using a variety of pedagogical strategies 3
	3	Employing effective language, structure and text to communicate curriculum strategies and ideas 4

7. Directed study hours

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.

7.1. Schedule

PERIOD AND TOPIC	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 Learning Materials
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 Learning Materials
Module 3 Weeks 8-10 General Capabilities and Cross-curriculum Priorities	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 Learning Materials

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

Please note: 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) or course reader

Please note that you need to have regular access to the resource(s) listed below. Resources may be required or recommended.

REQUIRED?	AUTHOR	YEAR	TITLE	PUBLISHER
Required	Venville, G., Dawson, V. & Donovan, J.	2019	The Art of Teaching Science: A comprehensive guide to the teaching of secondary school science	Allen & Unwin

8.2. Specific requirements

Not applicable

9. How are risks managed in this course?

Health and safety risks for this course have been assessed as low. It is your responsibility 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 and to familiarise yourself with the University's general health and safety principles by reviewing the [online induction training 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:

The final mark is in the percentage range 47% to 49.4%

The course is graded using the Standard Grading scale

You have not failed an assessment task in the course due to academic misconduct

10.3. Assessment: Submission penalties

Late submission of assessment tasks may 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 to negotiate an outcome.

10.4. Study help

For help with course-specific advice, for example what information to include in your assessment, you should first contact your tutor, then your course coordinator, if needed.

If you require additional assistance, the Learning Advisers are trained professionals who are ready to help you develop a wide range of academic skills. Visit the [Learning Advisers](#) web page for more information, or contact Student Central for further assistance: +61 7 5430 2890 or studentcentral@usc.edu.au.

10.5. Wellbeing Services

Student Wellbeing provide free and confidential counselling on a wide range of personal, academic, social and psychological matters, to foster positive mental health and wellbeing for your academic success.

To book a confidential appointment go to [Student Hub](#), email studentwellbeing@usc.edu.au or call 07 5430 1226.

10.6. AccessAbility Services

Ability Advisers ensure equal access to all aspects of university life. If your studies are affected by a disability, learning disorder mental health issue, injury or illness, or you are a primary carer for someone with a disability or who is considered frail and aged, [AccessAbility Services](#) can provide access to appropriate reasonable adjustments and practical advice about the support and facilities available to you throughout the University.

To book a confidential appointment go to [Student Hub](#), email AccessAbility@usc.edu.au or call 07 5430 2890.

10.7. 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>

10.8. 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