

## Course Outline

**Code: EDU353**

**Title: Teaching Senior Secondary Science 1**

<b>School of:</b>	Education
<b>Teaching Session:</b>	Semester 2
<b>Year:</b>	2019
<b>Course Coordinator:</b>	Dr Tim Strohfeldt Email: <a href="mailto:tstrohfe@usc.edu.au">tstrohfe@usc.edu.au</a>
<b>Course Moderator:</b>	Dr Margaret Marshman

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 explores the Queensland Senior Curriculum, pedagogy, assessment and reporting of Senior Secondary Science, Years 11 and 12. You will learn about current trends and best practice in science education. You will apply your science and pedagogical knowledge to design quality senior secondary learning activities and assessment tasks for the Queensland senior science curriculum.

#### **1.2 Course topics**

Queensland Senior Science Curricula  
Curriculum planning and alignment of content, pedagogy and assessment for senior science  
Teaching and learning strategies for engagement of diverse learners in science  
Assessment and reporting practices in senior science  
Designing science investigations  
Laboratory safety and risk assessment  
Integrating resources including information and communication technologies (ICT) into science curriculum  
Literacy and numeracy in senior science  
Embedding Aboriginal and Torres Strait Islander histories, culture and knowledge in senior science curriculum

### **2. What level is this course?**

300 level Graduate - Independent application of graduate knowledge and skills. Meets AQF and professional requirements. May require pre-requisites and developing level knowledge/skills. Normally taken in the 3rd or 4th year of an undergraduate program

### **3. What is the unit value of this course?**

12 units

#### 4. How does this course contribute to my learning?

<b>Specific Learning Outcomes</b> On successful completion of this course you should be able to:	<b>Assessment Tasks</b> You will be assessed on the learning outcome in task/s:	<b>Graduate Qualities or Professional Standards mapping</b> Completing these tasks successfully will contribute to you becoming:
Demonstrate your application of science content and Senior Science curriculum knowledge in developing science inquiry sequences, teaching and learning activities and assessment.	1. Science Teaching Knowledge and Skills 2. Planning a Lesson Sequence 3. Creating a Summative Assessment	Creative and critical thinkers. Engaged.
Apply knowledge of teaching and learning strategies that support the diversity of learners engaged in senior science.	1. Science Teaching Knowledge and Skills 2. Planning a Lesson Sequence 3. Creating a Summative Assessment	Creative and critical thinkers. Engaged.
Apply understandings of principles of assessment and reporting that monitor senior students' levels of achievement and progress in senior Science.	3. Creating a Summative Assessment	Creative and critical thinkers. Engaged.
Apply knowledge of planning, resourcing, teaching and managing to create learning experiences for students of Senior Secondary Science	2. . Planning a Lesson Sequence 3. Creating a Summative Assessment	Creative and critical thinkers. Engaged.
Employ effective language, structure and text to communicate curriculum strategies and ideas.	1. Science Teaching Knowledge and Skills 2. Planning a Lesson Sequence 3. Creating a Summative Assessment	Knowledgeable

#### 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

(Enrolled in Program AE304 or SE303 or ED315 and a Science teaching area) or enrolled in Program AB101, UU301, UU302 or XU301

##### 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)

It is expected that students engaging in this course have undertaken tertiary science content courses that will be drawn upon to complete this course.

## 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 1a (Week 3), gives you the opportunity to contribute and share ideas for context-based science (CBS) with your peers via tutorial presentations, and informs your Task 1b. Assessor feedback from Task 1b will assist you with subsequent assessment tasks.

### 6.3 Assessment tasks

Task No.	Assessment Tasks	Individual or Group	Weighting %	What is the duration / length?	When should I submit?	Where should I submit it?
1	Science Teaching Knowledge and Skills	Individual	40%	Task 1a: 5 minute presentation Task 1b: 800 words Task 1c: equivalent to 500 words	Task 1a: Week 4 tutorial, Task 1b: Friday, Week 4 Task 1c: during tutorials	Task 1a: Tutorial Task 1b: Blackboard SafeAssign Task 1c: tutorials
2	Planning a Lesson Sequence	Individual	30%	1500 words	Friday, Week 7	Blackboard SafeAssign
3	Creating a Summative Assessment	Individual	30%	1500 words	Friday, Week 10	Blackboard SafeAssign
			100%			

#### Assessment Task 1: Science Teaching Knowledge and Skills

<b>Goal:</b>	The goals are to evaluate the contribution of context to science learning, to integrate indigenous Australian history and culture with senior science, and to apply your science knowledge and skills to practical science activities and instruction. For students who do two science teaching areas this task is for teaching area 1. For example if you do a Biological Science major and a Chemical Science minor then this will be a <i>Biology</i> task.
<b>Product:</b>	Task 1a: Group presentation (5 minutes). Task 1b: Individual written report (800 words). Task 1c: knowledge tests and/or practical tests completed during your tutorials
<b>Format:</b>	Task 1a: Presentation: you will deliver a slide presentation of Australian and Torres Strait Islander history or culture that relates to science, explain the science involved, and identifies links with QCAA 2019 senior syllabus Unit Objectives and Subject Matter. Task 1b: You will write a review of a provided article on context-based science in secondary school science curricula. Task 1c: You will complete a series of skills and knowledge tests based on science practical activities completed during tutorials.
<b>Criteria:</b>	<ol style="list-style-type: none"> <li>1. Knowledge of integrating Aboriginal and Torres Strait Islander histories and cultures to engage a diversity of learners</li> <li>2. Synopsis of context-based science for learning and engagement</li> <li>3. Science teaching knowledge and skills</li> <li>4. Employ effective language, structure and text to communicate curriculum strategies and ideas</li> </ol>

**Assessment Task 2: Planning a Lesson Sequence**

<b>Goal:</b>	The goal of this task is to design and explain a sequence of two lessons designed to develop senior science students' understandings of a science concept. <u>For students who do two science teaching areas this task is for teaching area 1.</u> For example if you do a Biological Sciences major and a Chemical Sciences minor then this will be a <u>Biology</u> task.
<b>Product:</b>	A justified lesson plan sequence
<b>Format:</b>	Take the role of a teacher and use a provided template to prepare a sequence of two inquiry lesson plans that link with a unit from your 2019 senior syllabus. Your lessons are introducing a new science concept to students and must include science cognitive verbs. You will include a 500 word rationale and refer to your syllabus and education literature to justify your curriculum design, including integration of literacy, numeracy and 21 <sup>st</sup> Century skills.
<b>Criteria:</b>	<ol style="list-style-type: none"> <li>1. Apply science content and Senior Science curriculum knowledge (including literacy, numeracy, ICT and other 21<sup>st</sup> Century skills where appropriate) to evaluate alignment between the lesson sequence and QCAA senior syllabus.</li> <li>2. Apply knowledge of science curriculum and cognitive verbs to develop learning goals that support the diversity of learners engaged in senior science.</li> <li>3. Apply knowledge of planning, resourcing, teaching and managing senior science lessons to develop a science teaching and learning sequence</li> <li>4. Written communication skills and academic literacies including grammar, English expression, APA referencing conventions, and technical accuracy.</li> </ol>

**Assessment Task 3: Creating a Summative Assessment**

<b>Goal:</b>	The goal of this task is to demonstrate your ability to design a context-based senior science Research Investigation task that aligns with given curriculum. <u>For students who have two science teaching areas this is for teaching area 1.</u> For example if you do a Biological Science major and a Chemical Science minor then this will be a <u>Biology</u> task.
<b>Product:</b>	A senior secondary science summative assessment instrument sample; specifically a Research Investigation as specified in your 2019 QCAA senior syllabus.
<b>Format:</b>	You will create a Research Investigation task designed to be the summative assessment instrument for your Task 2 unit. This includes: <ul style="list-style-type: none"> <li>• A rationale for your Research Investigation Task context and design</li> <li>• A handout that scaffolds your Research Investigation Task for senior secondary science students</li> <li>• An instrument-specific marking guide (ISMG) for your Research Investigation Task (not included in the word count)</li> </ul>
<b>Criteria:</b>	<ol style="list-style-type: none"> <li>1. Application of Senior Science curriculum knowledge.</li> <li>2. Application of knowledge of teaching and learning strategies that support a diversity of learners.</li> <li>3. Apply knowledge of current science issues to resourcing, planning and teaching senior science.</li> <li>4. Formulation of curriculum-aligned assessment and reporting systems that monitor students' levels of achievement and progress.</li> <li>5. Written communication skills and academic literacies including grammar, English expression, APA referencing conventions, and technical accuracy.</li> </ol>

## 7. What are the course activities?

### 7.1 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. A blended learning approach is used to deliver this course, including a mix of synchronous and asynchronous materials and activities accessed through Blackboard. Directed study hours may vary by location. Student workload is calculated at 12.5 learning hours per one unit

### 7.2 Course content

Week # / Module #	What key concepts/content will I learn?
<b>Module 1</b>	Science Engagement: Scientific literacy and Science citizenship Context-based science.
<b>Module 2</b>	Science Skills: Representations for teaching and learning science. Teaching others to use and care for laboratory equipment. Laboratory safety and risk assessment Literacy, numeracy and 21 <sup>st</sup> Century skills integrated in Science teaching and learning Science experiments and investigations: when, why, what and how.
<b>Module 3</b>	Teaching Science: Exploring QCAA senior secondary sciences curricula. External and constructive curriculum alignment for designing and planning learning activities. Science signature pedagogies
<b>Module 4</b>	Assessing Science: The different types of assessment used in senior science in Queensland. Assessment 'of, for and as' learning. External and constructive curriculum alignments for designing assessment tasks Feedback, moderation and reporting.

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)

There are no prescribed texts for this course, but you will need your own lab coat for tutorials.

### 8.2 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](mailto:studentcentral@usc.edu.au)

### 10.5 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>

### 10.6 General Enquiries

In person:

- **USC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **USC South Bank** - 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](mailto:studentcentral@usc.edu.au)

### 10.7 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: Science Teaching Knowledge and Skills	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. 2.4 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. 3.1 Set learning goals that provide achievable challenges for students of varying abilities and characteristics. 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
Task 2: Planning a Lesson Sequence	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. 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.

	<p>3.4 Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning.</p> <p>3.5 Demonstrate a range of verbal and non-verbal communication strategies to support student engagement</p> <p>3.6 Demonstrate broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning.</p> <p>4.1 Identify strategies to support inclusive student participation and engagement in classroom activities.</p> <p>4.2 Demonstrate the capacity to organize classroom activities and provide clear directions.</p> <p>4.5 Demonstrate an understanding of the relevant issues and strategies available to support the safe and responsible use of ICT in learning and teaching.</p>
Task 3: Creating a summative assessment	<p>2.1 Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area.</p> <p>2.2 Organise content into an effective learning and teaching sequence.</p> <p>2.5 Know and understand literacy and numeracy teaching strategies and their application in teaching areas.</p> <p>2.6 Implement teaching strategies for using ICT to expand curriculum learning opportunities for students.</p> <p>3.1 Set learning goals that provide achievable challenges for students of varying abilities and characteristics.</p> <p>3.4 Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning.</p> <p>3.5 Demonstrate a range of verbal and non-verbal communication strategies to support student engagement</p> <p>5.1 Demonstrate understanding of assessment strategies, including informal and formal, diagnostic, formative and summative approaches to assess student learning.</p> <p>5.2 Demonstrate an understanding of the purpose of providing timely and appropriate feedback to students about their learning.</p> <p>5.3 Demonstrate understanding of assessment moderation and its application to support consistent and comparable judgements of student learning.</p> <p>5.4 Demonstrate the capacity to interpret student assessment data to evaluate student learning and modify teaching practice.</p> <p>5.5 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.</p>