



Course Outline

Code: EDU355

Title: Teaching Senior Secondary Science 2

School of:	Education
Teaching Session:	Semester 2
Year:	2019
Course Coordinator:	Dr Margaret Marshman: mmarshma@usc.edu.au
Course Moderator:	Assoc. Prof. Deborah Heck

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 is only for students who have two teaching areas in the senior sciences. You will extend and refine your knowledge of the Queensland Curriculum, pedagogy, assessment and reporting of Senior Secondary Science. You will develop skills in designing programs that develop critical and creative thinking skills in your students by engaging them in student-centred, experiential science investigations. Planning and managing science experiments and extended experimental investigations are a feature of this course. You will attend tutorials that are specific to your science minor teaching area.

1.2 Course topics

Queensland Senior Science curricula
Curriculum planning and alignment of content, pedagogy and assessment for senior science
Assessment and reporting practices in senior science
Facilitating engaging experimental investigations for your students
Student safety and risk assessment
Integrating resources including information and communication technologies (ICT) into science curriculum
Literacy and numeracy in senior science

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?

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:
Demonstrate your application of science content and Senior Science curriculum knowledge in developing science inquiry sequences, teaching and learning activities and assessment.	1. Leading a science demonstration and class discussion 2. Inquiry science experiments report 3. Exam	Creative and critical thinkers. Engaged.
Apply knowledge of teaching and learning strategies that support the diversity of learners engaged in senior science.	1. Leading a science demonstration and class discussion 2. Inquiry science experiments report 3. Exam	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.	2. Inquiry science experiments report 3. Exam	Creative and critical thinkers. Engaged.
Apply knowledge of planning, resourcing, teaching, managing and assessing senior science.	1. Leading a science demonstration and class discussion	Creative and critical thinkers. Engaged.

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

Students must be (Enrolled in Program SE303 and two Science teaching areas) or enrolled in Program AB101, UU301, UU302 or XU301

5.2 Pre-requisites

Nil

5.3 Co-requisites

EDU353

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

In Week 2 you will lead a (formative) group conversation similar to Task 1 for practice and feedback.

6.3 Assessment tasks

Task No.	Assessment Tasks	Individual or Group	Weighting %	Duration / length	When should I submit?	Where should I submit it?
1	Leading a science demonstration and class discussion	Individual	20%	10 minutes	Weeks 3 to 4	In the lecture
2	Inquiry science experiments report	Individual	45%	2000 words	Monday Week 9	Safe Assign
3	Exam	Individual	35%	90 minutes	Final Week	In lecture
			100%			

Assessment Task 1: Leading a science demonstration and class discussion

Goal:	The goal of this task is to demonstrate your capacity to engage students with Science through demonstrations and discussion. For students who do two science teaching areas this task is for teaching area 2. For example, if you do a Biological Sciences major and a Chemical Sciences minor then this will be a chemistry task
Product:	Science demonstration and substantive conversation
Format:	You are taking the role of a teacher of senior students who is presenting a demonstration stimulus (real, modelled or virtual) linked to the subject matter and inquiry pedagogy of your 2019 QCAA senior syllabus; including cognitive verbs and 21 st Century skills. Following the demonstration you will facilitate a class discussion that links the demonstration to the subject matter. The purpose of this is to develop your ability to facilitate a class discussion using Socratic questioning or a substantive conversation, to engage every student in the discussion, and to guide the discussion towards desired outcomes linked to your curriculum.
Criteria:	<ol style="list-style-type: none"> 1. Application of knowledge of science content and senior Science curriculum elements to plan (using cognitive verbs), resource, teach and manage an inquiry learning activity. 2. Application of knowledge of teaching and learning strategies that support the diversity of learners engaged in senior Science. 3. Oral communication skills

Assessment Task 2: Inquiry science experiments report.

Goal:	The goal of this task is to demonstrate your understanding of science inquiry learning and how to integrate inquiry in student experiments using a 21 st Century approach and skills. For students who do two science teaching areas this task is for teaching area 2. For example, if you do a Biological Sciences major and a Chemical Sciences minor then this will be a chemistry task
Product:	Written report
Format:	You will write a report about inquiry learning in school science that includes: <ul style="list-style-type: none"> • an overview of inquiry learning for Queensland science students • a range of inquiry approaches to suggested and mandatory practicals from your QCAA senior syllabus that include 21st Century Skills • an original lesson sequence that demonstrates appropriate application of an inquiry approach to a QCAA senior science <i>student experiment</i> assessment using diagnostic, formative or summative as appropriate.
Criteria:	<ol style="list-style-type: none"> 1. Application of science curriculum knowledge to develop science inquiry sequences. 2. Knowledge of teaching and learning strategies that support a diversity of learners engaged in senior science. 3. Apply knowledge of principles of assessment (diagnostic/formative/summative) and reporting. 4. Written communication and academic literacies including grammar, English expression, APA referencing conventions, and technical accuracy.

Assessment Task 3: Exam

Goal:	The purpose of this task is to demonstrate your knowledge of the Course topics.
Product:	Exam
Format:	An exam will provide you with the opportunity to provide evidence of your engagement with Course topics. The 60-minute exam consists of short-answer and extended response questions. Exam content will include but not be limited to the following topics: <ul style="list-style-type: none"> • Interpreting and teaching senior science curriculum • Science pedagogical content knowledge for senior secondary classroom practice • Science experiments and field trips: planning, design, student safety and risk assessment • Evaluation of assessment and reporting systems that monitor students' level of achievement and progress
Criteria:	<ol style="list-style-type: none"> 1. Application of Science curriculum pedagogical and content knowledge to classroom scenarios. 2. Knowledge of assessment planning and design for Senior Secondary students. 3. Knowledge of resources to support student learning of Senior Secondary students.

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?
Module 1	Science demonstrations and experiments – what's the difference and how do you decide which to use? Substantive communication and narrative promoting engagement, inquiry and critical and creative thinking
Module 2	Planning and conducting senior science experiments Planning and conducting science fieldtrips. Pedagogical and conceptual frameworks for senior science: inquiry learning, safety and ethics Adventurous Learning Underpinning factors for teaching and learning senior science Strategies and responsibilities for quality assessment.

Please note that the course content 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. and Dawson, V.	2012	The Art of Teaching Science	Allen & Unwin: Singapore

You will also require your own lab coat and covered shoes for tutorial activities.

8.2 Specific requirements

You will need to successfully complete a laboratory induction quiz in week 1 prior to attending tutorials

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 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

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: Leading a science demonstration and class discussion	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. 3.4 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: Inquiry science experiments report	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. 2.5 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.

	<p>3.2 Plan lesson sequences using knowledge of student learning, content and effective teaching strategies.</p> <p>3.3 Include a range of teaching strategies.</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>3.6 Demonstrate broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning.</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>
Task 3: Exam	<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>2.4 Demonstrate broad knowledge of, understanding of and respect for Aboriginal and Torres Strait Islander histories, cultures and languages.</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>3.3 Include a range of teaching strategies.</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>3.6 Demonstrate broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning.</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>