Course Outline

Code: EDU309
Title: Teaching Science in Primary Schools

School of: Education
Teaching Session: Semester 2
Year: 2019
Course Coordinator: Beverly Dann Email: bdann@usc.edu.au.
Course Moderator: Dr Sharon Louth

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 engages Big Ideas in science to build your science literacy & proficiency as a science teacher. Throughout the course you will plan & take part in hands-on activities & investigations to explore science concepts and model the pedagogy of science. You will build your familiarity with the Australian Curriculum – Science by exploring the links between the curriculum strands, science Big Ideas & science classroom activities.

   1.2 Course topics
   - Understand and apply ‘big ideas’, including the particle model for matter, energy and forces, and the Nature of Science
   - Science pedagogies and managing a science classroom: student engagement, learning by inquiry, active learning, context, argumentation, representations
   - Engage with technologies to enhance science education
   - Apply safety and ethics to practice

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?**

<table>
<thead>
<tr>
<th>Specific Learning Outcomes</th>
<th>Assessment tasks</th>
<th>Graduate Qualities or Professional Standards mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>On successful completion of this course, you should be able to:</td>
<td>You will be assessed on the learning outcomes in task/s:</td>
<td>Completing these tasks successfully will contribute to you becoming:</td>
</tr>
<tr>
<td>Build strong personal science literacy and engage with Big Ideas in science in a range of learning and investigative contexts. Develop skills for promoting scientific literacy and integration of literacy and numeracy skills.</td>
<td>Task 1, Task 2, Task 3, Task 4</td>
<td>Knowledgeable. Creative and critical thinkers.</td>
</tr>
<tr>
<td>Evaluate links between science content, the Australian Curriculum - Science (ACS), literacy and numeracy capabilities, and learning theory and teaching strategies that contribute to planning science education activities.</td>
<td>Task 1, Task 3, Task 4</td>
<td>Knowledgeable. Empowered.</td>
</tr>
<tr>
<td>Apply innovative and adaptive science education design, including use of resources, including ICT, ethics and risk management protocols, application of literacy and numeracy strategies to promote scientific literacy, to plan science activities and events that facilitate student engagement and achievement</td>
<td>Task 1, Task 3, Task 4</td>
<td>Creative and critical thinkers. Empowered.</td>
</tr>
<tr>
<td>Develop competency incorporating design technologies approaches to support your science teaching, further learning and professional advancement. Explore literacy and numeracy strategies to promote scientific literacy.</td>
<td>Task 4</td>
<td>Sustainability-focussed. Engaged.</td>
</tr>
</tbody>
</table>

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 ED303 or ED304 or ED306 or UU301 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)**

ED304 students (Bachelor of Primary Education) will have successfully completed minimum of 12 Education Courses, not including school placement courses.
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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
Early feedback is provided as part of task 1a during week 1. The expectations of the course assessment will become very clear through participation in collaborative activities that emulate the nature of the assessment in the course.

6.3 Assessment tasks

<table>
<thead>
<tr>
<th>Task No.</th>
<th>Assessment Tasks</th>
<th>Individual or Group</th>
<th>Weighting</th>
<th>What is the duration/length?</th>
<th>When should I submit?</th>
<th>Where should I submit it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Investigations</td>
<td>Individual</td>
<td>0%</td>
<td>Tutorial activity</td>
<td>Week 1</td>
<td>In Tutorial</td>
</tr>
<tr>
<td>2a</td>
<td>Chemical Science Exam</td>
<td>Individual</td>
<td>20%</td>
<td>40 minutes</td>
<td>Tutorial week 4</td>
<td>Tutorial</td>
</tr>
<tr>
<td>3</td>
<td>Chemical Science Investigation</td>
<td>Individual</td>
<td>30%</td>
<td>Tutorial activity and completed template</td>
<td>Week 5 tutorial activity Week 6 submit, Monday 9am</td>
<td>In Tutorial &amp; Blackboard Safe Assign</td>
</tr>
<tr>
<td>2b</td>
<td>Physical Science Exam</td>
<td>Individual</td>
<td>20%</td>
<td>40 minutes</td>
<td>Tutorial week 9</td>
<td>Tutorial</td>
</tr>
<tr>
<td>4</td>
<td>Physical Science Investigation</td>
<td>Individual</td>
<td>30%</td>
<td>1-2 minute video in tutorial and completed template</td>
<td>Week 10 tutorial activity Submit Monday week 11 9am</td>
<td>In Tutorial &amp; Blackboard Safe Assign Video upload to Blackboard</td>
</tr>
</tbody>
</table>

Assessment Task 1: Introduction to Investigations

<table>
<thead>
<tr>
<th>Goal:</th>
<th>The goal of this task is to demonstrate knowledge of the concepts, substance, structure and teaching strategies of the science discipline area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product:</td>
<td>An investigation report</td>
</tr>
</tbody>
</table>
| Format: | Working in a small group, you will design and complete a brief investigation. Working individually, you will then write a report of your investigation for in class peer review. Task 1a will be conducted and reviewed during tutorial. You will need to:  
  - Demonstrate knowledge and understanding of science investigation as part of an inquiry pedagogy for primary science classrooms  
  - Employ conventions of literacy and numeracy to produce representations of science information, concepts and ideas |
| Criteria: | • Knowledge and understanding of the science discipline area  
  • Literacy and numeracy to represent science information, concepts and ideas |
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**Assessment Task 2a & b: Understanding Science Exams**

<table>
<thead>
<tr>
<th>Goal:</th>
<th>The goal of this task is to demonstrate science content knowledge and curriculum understanding aligned with the Australian Curriculum: Science for primary school teachers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product:</td>
<td>Examination</td>
</tr>
<tr>
<td>Format:</td>
<td>Online Examination, closed book, multiple choice and short answer</td>
</tr>
<tr>
<td>Criteria:</td>
<td>Understanding Big Ideas in science and applying them to a range of contexts. Understanding the Australian Curriculum: Science.</td>
</tr>
</tbody>
</table>

**Assessment Task 3: Chemical Science Investigation**

<table>
<thead>
<tr>
<th>Goal:</th>
<th>The goal of this task is to demonstrate understanding of Chemical Science through the design, trial and production of a scientific investigation project.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product:</td>
<td>Chemical Science Investigation</td>
</tr>
<tr>
<td>Format:</td>
<td>Contemporary science teaching and learning develops students' ability to follow an inquiry approach by creating and completing investigations in science. This course will teach you how to create an investigation suitable for primary aged students then allow you time to complete the investigations yourself to deepen your personal understanding of inquiry through investigations. There are two parts to this investigation assignment.</td>
</tr>
<tr>
<td>Part A.</td>
<td>Working in a small group in tutorial (just as students would in a classroom), you will design and trial a predetermined investigation that explores a significant element of the Australian Curriculum: Science (Chemical Science), for Mid-Upper Primary students. Materials will be provided in tutorial. Your investigation plan will be cultivated over several lessons.</td>
</tr>
<tr>
<td>Part B.</td>
<td>Your final product will require research into the topic of the investigation. <strong>It will be an individual submission</strong> and will include your investigation task sheet located on Blackboard with curriculum links, a risk management evaluation, explanation of the science for primary teachers, graphs and data tables relevant to the investigation. (In essence, this is similar to planning for teaching and learning in science through investigations for primary students.)</td>
</tr>
</tbody>
</table>

You will need to:
- Plan and evaluate a science investigation including ethical and risk management protocols to address a stated aim.
- Identify the year level(s) and curriculum components that are most suitable for the investigation (3-8). **Remember to consider developmental appropriateness.**
- Demonstrate knowledge and understanding of the concepts, substance and methods
- Demonstrate how to link literacy and numeracy strategies to the investigation process for the promotion of scientific literacy.
- Demonstrate a knowledge of a range of resources including ICT, when applicable, to engage students
- Demonstrate collaborative planning and shared workload.

| Criteria: | **Demonstrate knowledge and understanding of the Australian curriculum: Science content, human Endeavour and Inquiry skills including links to Literacy and Numeracy.**
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | **Apply knowledge and understanding of science ethics and safety with materials.**
|           | **Design of an investigation and synthesis of the Science content learning outcomes.**
|           | **Written communication skills and academic literacies including English expression grammar, spelling, punctuation, APA referencing conventions.** |
Assessment Task 4: Physical Science Investigation

<table>
<thead>
<tr>
<th>Goal:</th>
<th>The goal of this task is to demonstrate understanding of Physical Science through the design, trial, and production of a scientific investigation project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product:</td>
<td>Physical Science Investigation</td>
</tr>
<tr>
<td>Format:</td>
<td>Contemporary science teaching and learning develops students' ability to follow an inquiry approach by creating and completing investigations in science. This course will teach you how to create an investigation suitable for primary aged students then allow you time to complete the investigations yourself to deepen your personal understanding of inquiry through investigations. There are two parts to this investigation assignment. <strong>Part A.</strong> Working in a small group in tutorial (just as students would in a classroom), you will design, trial and video an investigation that explores a significant element of the Australian Curriculum – Science (Physical Science), for Mid-Upper Primary. Your investigation plan will be cultivated over several previous lessons.  <strong>Part B.</strong> Your final product will require research into the topic of the investigation. <strong>It will be an individual submission</strong> and will include your investigation task sheet located on Blackboard with curriculum links, a risk management evaluation, explanations of the science for teachers, graphs and data tables relevant to the investigation. (In essence, this is similar to planning for teaching and learning in science through investigations for primary students.)</td>
</tr>
<tr>
<td>You will need to:</td>
<td>- Plan, video and evaluate a science investigation, including ethical and risk management protocols to address a stated aim.  - Identify the year level(s) and curriculum components that are most suitable for the investigation (3-8). <strong>Remember to consider developmental appropriateness.</strong>  - Demonstrate knowledge and understanding of the concepts, substance and methods of science.  - Demonstrate a knowledge of a range of resources including ethical use of ICT, when applicable, to engage students  - Demonstration of collaborative planning and shared workload.  - Upload video and templates in two separate uploads to Blackboard.</td>
</tr>
<tr>
<td>Criteria:</td>
<td>- Knowledge and understanding of the Australian curriculum: Science content, human Endeavour and Inquiry skills including links to Literacy and Numeracy.  - Applied knowledge and understanding of science ethics and safety with materials and ICT.  - Design of an investigation and synthesis of the Science content learning outcomes.  - Written communication skills and academic literacies including English expression grammar, spelling, punctuation, APA referencing conventions.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Week # / Module #</th>
<th>What key concepts/content will I learn?</th>
</tr>
</thead>
</table>
| Module 1 Learning and Teaching about Matter | • The Particle Theory for Matter  
• States of matter  
• The water cycle  
• Mixtures and compounds  
• Physical and chemical changes Alternative conceptions  
• The Nature of Science  
• Big Ideas and key concepts  
• The Australian Curriculum – Science  
• Scientific Literacy and Science Literacy and Numeracy Science Pedagogies |
| Module 2 Learning and Teaching about Physical Science concepts | Forces  
Energy  
Alternative conceptions  
The Nature of Science  
Big Ideas and key concepts  
The Australian Curriculum – Science  
Scientific Literacy and Science Literacy and Numeracy Science Pedagogies |

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:

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Title</th>
<th>Publisher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loxley, P.; Dawes, L.; Nicholls, L. &amp; Dore, B.</td>
<td></td>
<td>Teaching Primary Science: Promoting Enjoyment and Developing Understanding 3rd Edition</td>
<td>Pearson Education Ltd</td>
</tr>
</tbody>
</table>

8.2 **Specific requirements**

It is your responsibility to attend lectures and tutorials to obtain the Course topics and seek clarification. It will be necessary to spend time outside of class preparing for the content exam. There are two weeks in which a laptop will be required in tutorial. If you don’t have one, please make arrangements to share with another student.

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):

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Australian Professional Standards for Teachers (Graduate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 2: Understanding Science Exam</td>
<td>2.1</td>
</tr>
<tr>
<td>Task 3: Chemical Science Investigation</td>
<td>1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6</td>
</tr>
<tr>
<td></td>
<td>3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7</td>
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<tr>
<td></td>
<td>4.1, 4.2, 4.4, 4.5</td>
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<td>5.1, 5.4</td>
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<td></td>
<td>6.3, 6.4</td>
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<td></td>
<td>7.1</td>
</tr>
<tr>
<td>Task 4: Physical Science Investigation</td>
<td>1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6</td>
</tr>
<tr>
<td></td>
<td>3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7</td>
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<td>4.1, 4.2, 4.4, 4.5</td>
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